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Industrial Finishing

An Independent Publication Devoted To The Finishing of Industrial Products

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With the Editor

REPORTS FROM INDUSTRIAL FINISHING'S representatives and the heavy mail that comes into this office are indicative of an increasing and more widespread interest in everything pertaining to modern finishing in industry. Users of finishing materials, equipment and supplies are keenly alert to keep in touch with the very latest progress. The mere mention of any product that may possibly offer an advantage over what is now in use, or the suggestion of something which may simplify present methods, solve a perplexing problem or remedy an existing trouble—such an item immediately arouses interest and brings in numerous inquiries.

INDUSTRIAL FINISHING welcomes the opportunity to be of service to all individuals and firms in the industry and we are doing our best to promote the advancement of all that is beneficial in the way of improvement. The splendid co-operation of readers, writers and advertisers is helping us to do this in a better and bigger way.

As the volume of advertising increases, more editorial matter is being added and it is carefully selected and presented to include more of variety, value and interest. Something new and attractive is in store for every issue.

W. H. Rohr

Managing Editor

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Ordering and Checking Up Finishing Materials

Assistant to the President, at Virginia Furniture Co., explains a simple checking and perpetual inventory system for finishing materials, which is giving satisfactory results in every respect

By G. T. Hennessey

IN THE Virginia Furniture Co.'s modern plant at Martinsville, Va., an excellent system has been developed and placed in operation for ordering, receiving, tagging, storing, requisitioning and keeping perpetual inventory on quantities of finish used in the finishing department.

Through the operation of this system, the management keeps track of what quantities, kinds and brands of finish are on hand, and can compile an analysis of all materials used during any specific period of time. The record also serves as a convenient reference for the foreman finisher when ordering new materials, and provides an absolute check-up on what goods are delivered.

Shipments Received

Shipments of finishing materials are received in steel drums and usually they are delivered by the company's trucker, who hauls them from the local freight house by motor truck. Upon arrival at the factory the truckman takes his freight bills to the main office where they are promptly checked up with the invoice to determine what each drum contains. A memorandum slip is then made out and on it is listed each drum as to contents, name of manufacturer, date and tag number. Each drum is given a tag number, and brass tags bearing these numbers are handed to the truck driver or receiving clerk, with the memorandum slip.

The driver attaches the proper brass tag by wire to each drum, unloads the drums in a fireproof storage house and delivers or sends the memorandum slips to the finishing foreman. The finishing foreman keeps these memorandum slips on file and fills out a card record of materials on hand for his own convenience and future reference.

Drum No.	Date Rec'd	Contents	From	Price	Freight	Date Opened	Remarks

The heading of form on which entries are made.

Ordering in a Drum

When the foreman desires a drum of material brought to the finishing room, he orders it by the number of the brass tag which is wired to it; as a result, the average flunky can easily identify and bring in the right drum. When the drum is delivered to the finishing room, the brass tag is removed and sent to the finishing foreman.

The foreman makes sure that the correct drum has been delivered, checks it on his reference card of materials and then sends the tag back to the main office for use in making up the office records, after which it is hung up with the other returned tags. A record of finishing materials ordered, received, stored and tapped for use in the finishing room is kept in the main office, on a form like that shown herewith. The foreman keeps his records on a similar form.

Merits of System

The form which is kept in the office is compared from time to time with that of the foreman finisher; when both tally perfectly it is evident that the outstanding tags represent stock on hand, and that the returned tags cover material which has been used. Another advantage to be derived from this system is the valuable information, obtainable at any period, as to actual quantities used. For instance, when production is high there is a tendency to cover more cases in proportion to the amount of material used than when it is low, etc. Theft of a drum can be determined, if the tag does not show up.

When Veneer Damages Finish

Some finishers are receiving complaints about their finish losing its smoothness some few weeks or months after it has been rubbed. They are wondering if the cause is in the material used or in the method of doing the work.

It does sometimes happen that a finish will lose its luster on account of inferior material having been used, or the filler not having properly dried before being coated over. But the cause of the prevailing trouble at the present time is neither of these, as I have discovered after considerable investigation. The cause of the trouble lies beneath the finish; it is one over which the finish has no control, as I shall endeavor to point out.

A few years ago thicker veneers were used. At one time 1/16-in. veneers were used; then in the interest of economy it was cut to 1/20-in.; now most face veneers are 1/28-in.—some are even thinner. In addition to the heavier veneers formerly used, the stock was crossbanded with veneer not less than 1/16-in. This heavy crossbanding prevented swelling and shrinking of the corewood during atmospheric changes. In cases where there was no crossbanding the face veneer was usually heavy enough to serve that purpose, if it was laid with the grain at right angles to that of the core.

At the present time some furniture is made without crossbanding, the face veneer being laid with its grain running at right angles to that of the core wood. The present thin veneer is not strong enough to prevent swelling

and shrinking of the wood. If the veneer is laid on a wood that is very susceptible to atmospheric changes, such as most of the soft woods, the wood will sometimes swell sufficiently to break the thin veneer across the grain. At other times the swelling and shrinking is just enough to cause the slightest crinkling of the finish, and it is this crinkling that destroys the fine appearance of the rubbed varnish surface.

When something goes wrong with the finish there is always a disposition to blame the material used, if we cannot readily discover the cause elsewhere. Frequently the manufacturer of the material is unable to discover the cause, though satisfied his material is not at fault. The one cause here mentioned is a case to point. Very few manufacturers of finishing materials know enough about veneering and the making of plywood to locate the cause of the trouble about which complaint has been made.

The experienced investigator of finishing troubles examines every part of the work and makes comparisons. In the case under review, it was discovered that the finish did not lose its smoothness and lustre on solid walnut parts, nor on goods which had been properly crossbanded, though the materials used were the same in each case. It was learned that a great deal of the trouble was on drawer fronts.

During the humid weather of summer the fronts swelled so much that the drawers could scarcely be moved. During the winter, when the factory and the homes and offices were dry heated by artificial means, the drawers contracted and became loose. Careful checking up revealed that the trouble was more pronounced where the veneer had been laid on basswood and gum than where maple and birch had been used as a core wood for veneering.—Canada.

Mixing Paste Colors with Lacquer

A number of lacquer users in my territory are mixing paste colors ground in japan with clear and colored lacquers and tinting to the desired shade. The lacquer is put in an agitator barrel and agitated while the paste color is being added. Others make use of an ordinary ice-cream freezer, with belt attached to motor for the same purpose.—Joseph Cowan.

O'Neil Insures Employes

The O'Neil Duro Co., of Milwaukee, Wis., enamel and lacquer manufacturer, has made a gift of more than $60,000 group life insurance to its employes. The program is being underwritten by the Metropolitan Life Ins. Co., and features the advantages of a visiting nurse service. Each employee in the main classification receives $1,000 of life insurance.

Valentine's Permanent Color Exhibit

So many persons interested in automobile finishing and refinishing were unable to see the special exhibits of the Nitro-Valspar jewel colors during the New York and Chicago automobile shows, that Valentine & Co. have prepared a permanent exhibit which may be seen at their New York office, 456 Fourth Ave.

Automobile and body manufacturers, refinishers and others whose business requires that they follow the latest developments in colors and color combinations are invited to see this exhibit at their convenience. It includes not only panels the size of those used on passenger cars, but a collection of the jewels in their natural matrix settings which served as the actual inspirations for the color combinations that the panels were made to match.

First installment of a two-part article explaining methods and materials used by workmen who are experienced and skillful in the patching of damaged places in modern finished surfaces.

Patching the Finish on Furniture and Pianos

By F. D. Burchfield

IT IS often necessary to patch or renew the finish on furniture, pianos, chairs and similar articles, due to accidents that occur while the furniture is still in the factory or during its shipment and uncrating at the dealer's store. While the widespread use of clear and colored lacquer finishes has reduced the frequency of such accidents, due to the harder, tougher coating produced, it still is necessary at times to repair mars or scratches before the furniture is ready for sale.

Repair men at the furniture factories and in the dealers' stores have learned through years of experience, how to go about repairing a varnish finish, but they are not so well versed in methods of repairing lacquered work.

In the beginning, it should be definitely understood that no hard and fast methods can be given for this work, as practically every piece of furniture presents a slightly different problem, due to its color, or the type of the finish, or the nature of the injury. A few basic principles are given, however, which can be adapted to practically any set of conditions that may arise.

A Preventative Remedy

It should be remembered that the best remedy for mars, scratches and other defects in the finish is the preventative one. In other words, if no accident happens to the finish, there is little likelihood of having to patch it; consequently much time and expense will be saved. In the rubbing room and in the crating and

shipping departments of the factory, workmen should be careful to avoid injury to the finish. Packing methods should be carefully studied to insure a minimum of possible marring or scratching while loading or unloading, and while it is in transit.

Much injury can be avoided by using the proper methods in uncrating the finished article at the dealer's store. The method of crating should be carefully studied before the actual work of uncrating is started, so the crate can be removed as nearly as possible in the same manner as it was put on at the factory.

By starting to dismantle the crate at the proper point and following through in a systematic manner, much injury to the finish will be avoided. A great deal of injury is almost certain to occur when the crate is attacked with a claw hammer and wrecking bar, in a more or less haphazard manner, with the main thought being to extricate the finished article as quickly as possible.

Even where the best of precautions are taken, there will be a certain amount of patching necessary to repair damages between the uncrating floor and the display floor.

Use of Stick Shellac

If the scratch or damaged spot is through to the bare wood, the wood must be stained to match the remainder of the surface before any other coats are applied. While it is often possible for the dealer to obtain from the manufacturer of the article, the stain originally used on the piece, to do so usually means a delay of several days. For this reason standard oil stains or spirit stains are usually purchased and reduced or blended in the repair department to approximately match the color of the piece being repaired.

Before starting the repairing operation any loose or jagged edges should be cut away and the finish sanded down smooth. After the stain is dry, the scratch or dent should be filled up level with the surrounding surface with stick shellac, burning-in cement, or some similar patching compound. Stick shellac is obtainable in a great variety of colors, and a color should be selected which, when polished, will match or nearly equal the original color of the finish.

The Patching Tool

The method of using stick shellac is to soften it with heat and work it into the defect until the scratch or dent is filled up a little higher than the surrounding surface. A small alcohol lamp may be used to supply the heat, although there are now available, electrically heated knives or irons which eliminate the possibility of overheating the knife, or of depositing soot or other discoloring substances in the stick shellac.

The knife or patching tool is heated sufficiently so that when

Making repairs by using electrically heated knife and stick shellac. Photo, courtesy of Kruissink Bros., Chicago.

the knife is held against the end of a stick of shellac, a small portion of the shellac melts off. The softened shellac is then applied to the hole or other defect, and the process repeated until the surface is a little more than level with the surrounding finish.

Care should be taken to avoid overheating the knife, as a very hot knife may damage the surrounding finish, and in addition it may cause the shellac or cement to dry with a honeycombed effect. A match should never be used for heating the shellac, as the soot from the flame will discolor it. It is not good practice to apply the alcohol flame directly to the stick of shellac either, as the shellac is likely to be burned and discolored, and perhaps honeycombed.

After the defect has been built up even with the surrounding surface, the excess shellac or cement can be removed by scraping with a safety razor blade or a sharp chisel, but care must be taken to avoid damaging the surrounding varnished surface. After this preliminary smoothing operation, the repaired spot should be rubbed down to a true surface with fine sandpaper and oil or water, or with a felt rubbing block and FFF pumice stone mixed with paraffine rubbing oil. During this surfacing process, one must be careful not to rub through the varnish surrounding the patch, or an unsightly job will result.

French Polishing

Next the patch should be polished to match the surrounding varnished surface by the process known as French polishing. A polishing pad for this purpose is made by wrapping a ball of cotton in several layers of soft cotton cloth, such as cheesecloth, to form a soft pear-shaped mass about the size of a hen's egg. The cotton core of this pad should be saturated with a liquid shellac solution, consisting of four parts of denatured alcohol to one part of commercial 4-lb. cut orange or white shellac. This forms a reservoir of shellac solution which can be squeezed out through the cloth cover of the polishing ball as needed.

Next, a drop of linseed oil should be placed on the patch or on the polishing ball, being very careful not to apply too much oil. Then begin the polishing operation by barely touching the spot with the surface of the polishing ball. On flat surfaces use a figure eight stroke; on edges or spindles rub the full length of the patch with a straight stroke. Too much shellac should not be applied during this operation. Practice alone will teach the exact pressure to use on the pad and the amount of shellac to apply. The rubbing should continue, either with the original shellac ball, from which the shellac has all been used, or with a similar ball on which a drop of linseed oil has been applied, until the desired luster is obtained.

Packing Marks, Light Scratches and Mars

Light scratches, packing marks, small scuffed places and similar defects in a varnish finish can sometimes be repaired without resorting to the use of stick shellac, by rubbing or sanding the damaged place until it is smooth and then repolishing to the desired luster. Where the defect is too deep to be removed by this process, stick shellac should be used as outlined above.

Cracks and Checks

Usually it is advisable to remove the old finish and refinish completely, where the old finish is badly checked or cracked, but there is a very satisfactory method of repairing these defects, where it is not desired to remove the old finish. This method is as follows:

Dip a cloth in lacquer reducer and go over the cracked surface, applying just enough of the reducer to thoroughly wet the surface, but not enough to cause it to raise and blister up as though paint and varnish remover had been applied. Let the work stand until dry and then sand thoroughly to remove some of the checks and cracks, and to thoroughly clean up the work.

Then apply three or four coats of clear wood lacquer, reducing the first coat slightly to aid it in drying faster and to prevent it from softening up the old finish too much. It is better for these lacquer coats to be applied by spraying, but they can be brushed if no spraying equipment is available. After the last coat of lacquer has dried overnight, the surface can be rubbed and polished.

Next month, in the concluding installment of this article, the patching of enameled and painted finishes, clear lacquer finishes and colored lacquer finishes will be explained.

Who's Who in the Finishing Room

Recently I was called to solve some finishing problems in an industrial plant. The proprietor was away at the time but had left his son in charge. Naturally, I was introduced to the foreman finisher who was having finishing troubles. While going over these difficulties, the proprietor's son stepped into the finishing room and, holding a watch in his hand, said to me: "Do you know that you have wasted 15 minutes of my foreman's time?" Of course, I was surprised, but I promptly ended the interview and politely bid them "good-bye."

When the "old man" returned, he wrote that he would like to see me at once. When we met I explained my previous experience with his son. The young chap was called into the old man's office and told to stay where he belonged; that the 15 minutes I spent in the finishing room was worth 15 hours; also, that the industrial salesman is free to enter the finishing room to solve finishing problems at all times.—Joseph Cowan.

It is not an unusual thing for men to become so engrossed in telling the other fellow what to do as to overlook what they might do themselves.

Change du Pont Managers in Chicago

E. I. du Pont de Nemours & Co. announces the appointment of T. T. Toole as Branch Office Manager in Chicago of the Paint and Varnish Division. He succeeds B. A. Wilson who has been Sales Manager at Chicago for four years and who is now transferred to Philadelphia as Assistant to the General Director of Sales of the Paint and Varnish Division.

Hilo Lacquer Appears

The Newest Member of the Hilo Family of Finishes is Hilo Lacquer, said to be a composite of all the good and desirable things a lacquer should have. It comes in 16 attractive shades—also black, white and clear.

According to the description, it sets slowly to permit free working and flow out, yet dries fast; lustre—between eggshell and gloss; no objectional odor; and it may be used right over an old finish without shrivelling or lifting.

A 41-ft. A. C. F. cruiser owned by Chenevert & Co. of Detroit; 16 miles per hour.

Modern Motor-Boat Finishing

Describing some of the attractive motor boats exhibited at New York by prominent manufacturers, with special reference in detail to the exterior and interior color painting and finishing of same

By George D. Hirst, Inc.

THE GROWING demand for something new in the way of outdoor recreation has done much to evolve and confirm the status of the motor boat. Interest evinced in the permanent displays of prominent manufacturers in New York, is convincing proof of the hold that this most fascinating means of pleasurable relaxation has taken on the general public.

The utilitarian phase of motor boating is apparent also when we observe the increasing number of business men solving the ever difficult problem of commuting between city office and summer home.

Ranging in size from 30-ft. 'runabouts', making a speed as high as 45 miles per hour, to luxurious cruisers 68-ft. long, the problem of choosing the type best suited to one's purse and needs is comparatively easy. The color trend, emphasized in the motor cars of today has not been overlooked in these aquatic runabouts and knot-consuming water roadsters.

A Smart Cruiser

The 41-ft. a.c.f. cruiser, built by the American Car and Foundry Co., presents a wonderfully smart appearance, being finished below the water line with one coat of red lead and two coats of lead and oil, two coats of lead and zinc paint and a final coat of approved yacht enamel. In every case the finished color is optional with the buyer and, though white predominates, many are the unique and pleasing color combinations chosen.

All interiors are mahogany filled, stained and varnished with

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RAPID WALNUT SHADING STAIN

THIS is an exceptionally popular oil shading stain having a rich, antique color suitable for shaded walnut finishes. Sprays easily, dries quickly and can be handled in a few minutes. Color is permanent and does not fade. Can be finished over with varnish, shellac or lacquer.

Liberal samples sent free on request.

Prove it to yourself.

THE GILBERT SPRUANCE CO.
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"A FINISH FOR EVERY PURPOSE"

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three coats of best spar varnish rubbed down to an egg shell finish. All bright work on the exterior is given four coats of best spar varnish. Canvas decks and roofs are turned out with one coat of filler and three coats of deck paint in any color desired.

The gradual emergence of the motor runabout and cruiser from its long period of mechanical trouble and uncertainty, to an extremely efficient and dependable means of transportation and relaxation, has not been due to motor improvements alone. Painting and finishing too have played their part in every phase of motor boat development.

Enemies of Painted Surface

For years the conquest of salt water has defied the efforts of industrial finishers. Salt water and salt sea air have caused untold trouble to many who failed originally to give the quality of their paint jobs serious consideration. The peculiar marine worm, infesting practically all bodies of salt water, is oftentimes the bane of the embryo commander's existence. The hardiest paint and toughest wood fail to intimidate this animated gimlet of brace and bit inclinations.

Salt water sailing means barnacles and seaweed, too, and the gruelling ordeal of hull scraping also necessitates a paint job that is not going to be removed with these other encumbrances.

Latest Luxuries

The Fleetwing "38", a luxurious cruiser presented by the Greenport Basin and Construction Co. of New York, incorporates all the latest features of standardized construction together with an unusual grace of line. It is finished with an underbody copper paint, with a green boat top.

The topsides are white with mahogany moulding. The canvas decks are done in buff paint. All mahogany throughout is finished with the best spar varnish. The cabin interiors are in enamel tint with mahogany trim and dressers; the engine space is in gray paint. Gold leaf is given the preference for the name or numbers on bow and transom.

The Dodge Watercar, one of

A 35-ft. cruiser built at Wilmington, Del., plant of the American Car & Foundry Co.; 12 miles per hour.

SUNSTAND

A WATER STAIN IN A NEW FORM

Water stain has retained its popularity among furniture manufacturers because of one quality only—fastness to light.

No wood finisher would willingly continue to flood kiln dried lumber with water if he could get the same results some other way.

Staining with SUNSTAND is the other way.

In this patented liquid, ordinary soluble dyes dissolve readily, and with the finished SUNSTAND Stain, the wood is evenly and richly colored, without the grain being raised.

No sanding is needed, and the color is as permanent as that of a water stain.

SUNSTAND Stains bleed just enough in shellac to secure depth and beauty, and any of the commercial lacquers will work well, directly over the stain.

On open grained woods, SUNSTAND will fill without washing off, and in every respect act exactly like the water stain.

Oil stains will not do it.

Spirit stains will not do it.

SUNSTAND will!

MARIETTA PAINT & COLOR CO.

Marietta, Ohio **High Point, N. C.**

(Fill out and attach to your letterhead)

We are using water—oil stain. (Check)
We are interested in SUNSTAND STAIN. Please send sample.

Name.....

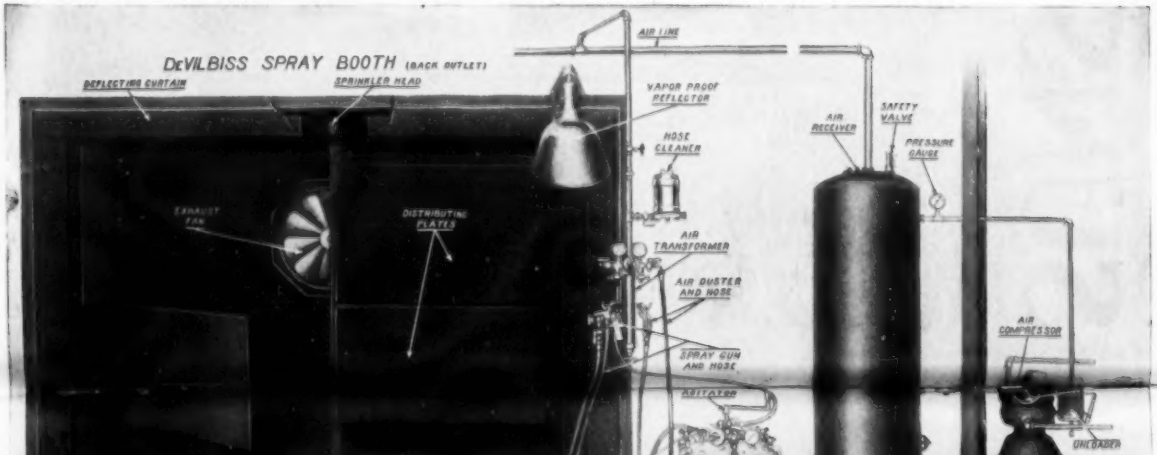
Address.....

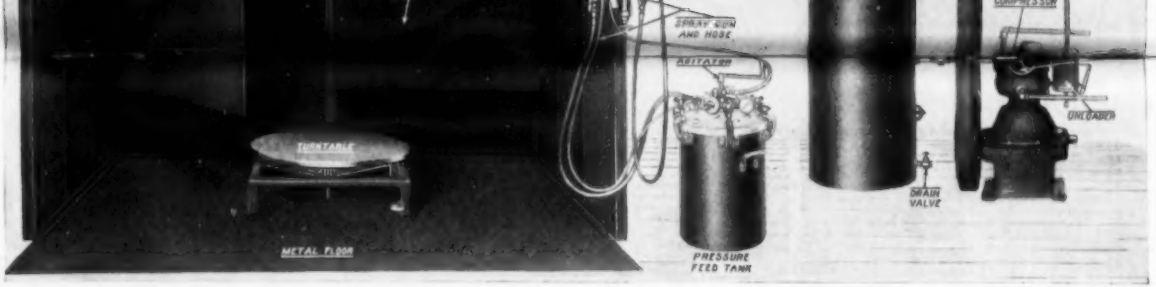
I.F.—June

The answer to Complete, Dependable and Low Cost Service in your finishing room

DeVilbiss Spray-finishing System

Here shown in typical complete installation





SOLVING the important problems of the finishing room, for well over fifteen years, in leading manufacturing plants the world over—plants of every size and character, producing every type of product—is the pre-eminent performance background of the DeVilbiss Spray-finishing System.

This background of invaluable DeVilbiss experience and intimate contact with the world's entire industrial field is of first importance to you ... Out of it has been developed today's unequaled DeVilbiss engineering, manufacturing and service facilities and the high perfection of DeVilbiss spray-finishing equipment ... And with this equipment and these facilities to serve you, there is insured complete and efficient solution of every problem of lacquer, varnish and other material application in your finishing room, plus reduction of your finishing costs.

Each item in the DeVilbiss line of spray-finishing equipment is scientifically correct in design, entirely practical as a production tool, easily installed and used. The complete installation soon pays for itself.

Consider what this complete, dependable and low cost DeVilbiss service in your finishing department means to your manufacturing operations and costs. Further interesting facts will be promptly mailed to you. Address—

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DeVilbiss
Spray-finishing System

Invite us to show you

Sun Flat Lacquer

We will display our goods at our expense, and give you practical advice. How best to use.

White No. 1 Lacquer

COLORLESS

Clear and transparent, looks like a coat of celluloid on work. Can be polished.

FINISHING ROOM FAVORITES

No. 115 Pale Rubbing

The reliable quality varnish that held its own so many years in the face of keen competition.

SUN VARNISH CO.

Louisville, Ky.

the outstanding products of this new trend toward aquatic motoring, is scientifically constructed of materials found in almost every part of the world. The grained mahogany planking for the decks, the sides and transoms of Dodge watercars, comes from Africa, while the white oak keel is from the lucrative oak forest of Virginia.

Mass Production Methods

The finishing process is essentially the same as that of other large manufacturers, but it is especially interesting to those who are acquainted with the various phases of automobile construction. The entire process of building Dodge watercars, from the raw materials to the complete runabout, wrapped, packed and ready for delivery, is divided into forty distinct operations, each of them definitely charted and detailed so that each man knows what he has to do in each operation.

Starting on seven slips at one side of the main assembly room, the boats proceed across the room in seven lines, different operations being carried on at each scheduled position as the boat moves along. When the boats reach the opposite wall they are ready to be completely smoothed down, sandpapered and made ready for the stain, which is then applied.

Then they are sent to the special varnish room which is dustproof and kept at the proper temperature for efficient drying of the varnish. Four coats of varnish are applied, the boat being sandpapered to a glossy smoothness before each coat. When a boat, running on wheels, arrives at the farther side of the varnish room, it is quickly transported to the finishing floor and the motor is then installed. A spar finish, because of its protective qualities in both fresh and salt water, is the last finish applied.

Since the building of motor boats today goes forward according to standardized automobile methods, it appears that public adoption of the water for recreational purposes is already assured. Figures taken at the beginning of 1927 indicate that approximately 800,000 motorboats are in use today. The year 1937 will probably find motorboat traffic rules in every city boasting of aquatic advantages. There seems to be a real market in this field for enterprising and wide-awake manufacturers of industrial finishes.

Say, Oldtimer! What do you think of present-day finishing methods? Spraying, dipping, machine-rubbing, lacquers, etc.? Some change.

Gilbert Spruance Enlarges Lacquer Plant

A contract was recently awarded by The Gilbert Spruance Co. for an addition to their lacquer plant which, when completed, will double the size of their lacquer building. This action was necessary, The Gilbert Spruance Co. states, because for some time the capacity of their present building has been taxed to the limit. This is a significant point of interest in view of the fact that the lacquer plant was erected only about a year ago.

Their success in this line, as in others, appears to depend on one dominant factor—they know what they are doing. Before they put their Q.E.D. furniture lacquers on the market, they spent 18 months experimenting with a number of the largest furniture manufacturers. The experience and judgment of these manufacturers, supplementing the experience of The Gilbert Spruance Co. in the wood finishing field, produced a line of lacquers whose perfection in quality can be readily appreciated.

Work will be started at once and the contractor will have the project completed in the near future.

How to do Expert Striping

Instructor of Painting at Hampton Institute, Hampton, Va., emphasizes the requirements of expert striping and explains in detail how to "carry on" and become skillful at this work

By A. F. Eibell

AT VARIOUS times I have read articles on striping, but except for some advice to beginners they don't seem to reveal much practical information. I am not so sure that much can be written that will really help, except practice—and then more practice. Still I have seen many indifferent stripers converted into topnotchers by a little prompting and an insight of what might be called "tricks of trade."

Care of Striping Pencils

Pencil brushes and their care, is perhaps the most important item. The pencils come in dagger points and square-ends, mounted the same in Nos. 0 to 4; and square quill pencils also, for broad lines and blacking off. The No. 0, while intended for a certain type of line, is seldom seen any more. The "hair line" is perhaps the best one for fine lining, while the No. 1 will make a good round line.

Others have their place in the scheme, of course, but those just named are the ones mostly used. In the square-edge pencil you can find anything from one to run a ⅛-in. line, or to glaze two lines at once, to a No. 4 which will run a ½-in. line, or a quill that will black off a ⅝-in. to 1-in. moulding at one stroke.

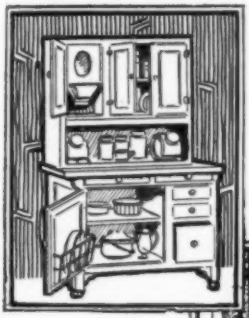
As to the care of tools, in factories and large custom shops they usually lay them out in oil over night, but for the man who loves his work it's best to clean out a pencil as soon as one is through with it; then grease it and lay it out. Some stripers use tallow, lard, etc., but plain vasaline is as good as anything where pencil brushes are used regularly, and it is much less trouble to clean out.

What really counts is to clean the striping pencil and work grease into it thoroughly at the heel. See that every hair is straight and press it on glass so it lays out smooth and straight until used again. The more you massage the brush the better it will be, but do it gently; don't treat it roughly.

Special Striping Colors

In addition to the above there are double liners that are useful on chassis striping and on some truck work—if you will study their use. Much depends upon

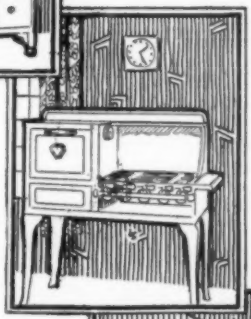
A white that stays white—



Pecora Cuticle Enamel

positively does not turn yellow, chip, break or peel.

It is the ideal finish for kitchen cabinets, refrigerators and all other products finished in the white.

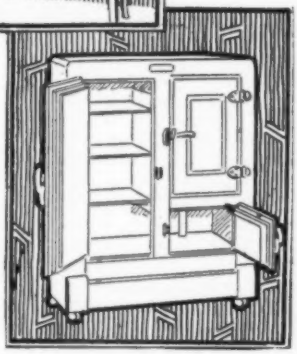


Cuticle Enamel

is particularly suited to bath tubs, bathroom fixtures, hospital equipment, etc., because it is impervious to acids, chemicals or similar liquids which destroy ordinary enamel.

You'll be surprised at the real merit of this air drying enamel.

We have been gradually improving this product for 65 years—we are enamel specialists. Liberal sample for the asking. Can be furnished to dry with a high gloss, egg shell or flat.



We also manufacture a complete line of colored enamels of high quality.

PECORA PAINT COMPANY

3rd & Sedgley Streets
Philadelphia, Pa.

Established 1862 by Smith Bowen

Incorporated 1911

colors for striping, their proper mixing, etc. Nearly all manufacturers today make a line of specially prepared striping colors and, of course, they are better than the japan colors found on the average shop bench. They are ground finer and special attention is paid to their covering qualities.

Knowledge Plus Skill

When you want to draw a particularly fine line, after color is mixed, add a little finishing varnish; in fact, if time permits the addition of some varnish—either rubbing or finishing varnish—it will help, for it gives a pull on the glass which helps in shaping up the striping pencil. However, some of the best stripers work with dead flat color because they can pull a longer line with one loading of the pencil, and they can follow up sooner and safer with the finishing coat of varnish.

Whatever method you follow, try and mix your color ready for use, so you can dip in it and work it into the pencil. Don't make it up in a gob, as I have seen recommended, and then work it out with the pencil and turpentine. Remember that a good pencil brush is made of squirrel hair—so-called camel hair. After you have worked hard to break it in, don't treat it as if it were a pallette knife. If color gets thick on the glass and gets to pulling too much, stop! Clean off the glass, rinse out pencil, etc. It pays to have things working *right*, it you want speed and accuracy in your work.

White is one of the most popular striping colors but, with perhaps the exception of very fine lines, it will show every place you tie up or connect your lines, if it is used "straight." If you will mix a little aluminum striping bronze in varnish and add it to your white, it will cover solid; it will do away with the necessity of second coating and will really look whiter under varnish.

The same applies with cream and straw colors. Don't over-do it; just add enough to do the trick. In fact, the addition of a good grade of striping bronze can be made to most colors without affecting their color, and it will add to the ease of working and covering too. Use gold or aluminum, as best suited to the color employed.

Professional vs. Amateur

Now how does the professional striper differ from the amateur? Mostly in the care of his tools and in having his materials right. The professional gets a clean, smooth color free from slugs, grit, skins, etc. An element of confidence is essential. If you will take a piece of chalk and lay out your stripe, or better still, get a piece of thin wood (cigar box cover is fine) and cut a V in it, having points the distance you want stripe from moulding or top of car, and then scribe a line, you will get a good layout; then follow it with the pencil brush stripe.

Some stripers use a compass for this, but it scratches and you don't always follow the line closely enough. The wood marker just makes a faint imprint which is easily removed by water rubbing it, if it is to be varnished, or by polishing if on lacquer. Before you put a striping pencil to the surface, if you are in doubt, get in position and pull an imaginary line. If there are any obstructions or anything to throw you off, you will find it. But when

EXPERIENCE has proven the utility of Vitraloid Wood Lacquer No. 2546. Furniture manufacturers who are using this material attest to the remarkable finish it produces and the service it gives.

Vitraloid Wood Lacquer No. 2546

Vitraloid Wood Lacquer No. 2546 is a true nitrocellulose product. It may be used to secure any wood finishing effect, and is suitable for various production schedules. Spray it just as it comes, directly over stain or filler—there is no danger of bleeding or lifting the undercoats. It does not require special handling to secure perfect results. A fact to consider is that it costs no more than a rubbing varnish.

Try out this wood lacquer and see how adaptable it is to your finishing schedule. Write to us today, and we will send you a generous no charge sample.

PRATT & LAMBERT-INC.

Manufacturers of

VARNISHES ENAMELS LACQUERS

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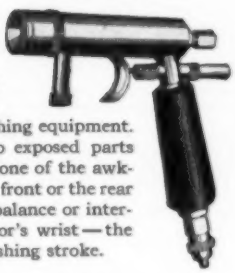
A Better Product

Pneu-Gun
ATOMIZATION

Licensed Under Wold Air Brush Patents



Illustrated here is the MASTERSTROKE model of the Pneu-Gun line which is included in the complete compressed air finishing equipment. Like all other guns of this make, it has no exposed parts to be damaged or broken. And here are none of the awkward double-sided hose attachments at the front or the rear end of the barrel to throw the gun out of balance or interfere with the free movement of the operator's wrist—the only movement necessary to guide the finishing stroke.

The Equipment that Has Rev

The Pneu-Gun is just as superior in mechanical construction and efficiency as it is in appearance. Has from 8 to 20 fewer parts and is one-third shorter. Is lightest in weight and can be used closest to the surface. Has no external moving parts to wear out or to pinch the fingers or blister the hand. Has no washers or packing to break up the free, steady flow of the material or to cause color bleeding. Every part removable with the fingers. No wrench or pliers tending to damage tip or head required.

Embodies New Atomization Principles

New atomization principles enable the Pneu-Gun to produce a lustrous, enamel-like finish with ordinary paint. Always reduces amount of rubbing required; in many cases eliminates ALL rubbing. Uses any kind of material. Is non-clogging and self-cleaning, permitting quick changes in colors and materials.

The Gun That's Easiest to Operate

Position of one-finger trigger material control gives maximum leverage. A light touch on this trigger changes width of stroke instantly. Being smaller and lighter, the Pneu-Gun gets to out-of-the-way places that are inaccessible with other guns. Revolver-like balance because of no hose interference is of highest importance.

Please send me catalog 101 for important detailed information.
Interested in Pneu-Gun Atomization ☐
Melrock Spray Booth ☐
Complete Compressed Air Finishing Equipment ☐
Apparatus for Testing Booth ☐

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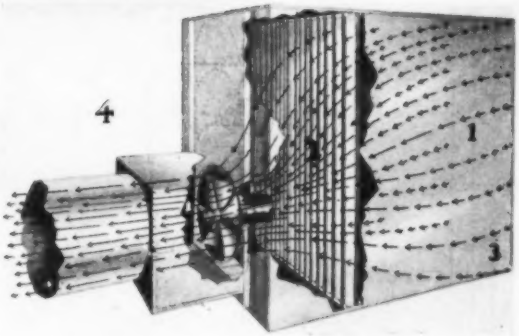


Melrock SPRAY BOOTH

Are More Than Mere Hoods or Coops for Men to Work In.

olutionized Spray Finishing

1. No dead air pockets — one of the exclusive advantages of this booth which is the result of its special design.
2. Arrangement of baffle plates necessitates a uniform pull across entire face of booth — a factor of supreme importance in preserving the operator's health. Other booths concentrate the pull of the air from the center of booth directly toward the fan.
3. No back drafts. No fumes to back up into the finishing room. Dust-free spraying.
4. Fan or motor can be raised or lowered as conditions may require. Motor only fully enclosed one on the market with the endorsement of the underwriters.

The Booth in which You Could Not Get an Explosion If You Tried

The Melrock Spray Booths are absolutely fireproof and lower insurance rates. Endorsed by factory and insurance inspectors.

Protect the Operator's Health — Keep all the harmful fumes and gases from the lungs of the operator, and protect him from all drafts that cause colds and stiffness.

If cleaning is required each baffle plate is taken out individually in a few minutes and without special tools. Replaced just as quickly.

Patents Pending

HAYWARD CO.

Established 1894

Austin Ave.

ILLINOIS

Spray Finishing Equipment

Test Your Spray Booth

If you are using a spray booth of any make and want to determine its efficiency or inefficiency in discharging fumes and gases, we will furnish you free of charge, an apparatus to make an interesting test. Use the coupon on the preceding page.

Copyright A. I. S.—J. E. Pollworth

A Lacquer that bats 1000% in the big league

It takes a real he-man lacquer to stand up under the strain of modern day competition. Many are called, but few are chosen. ROCKFORD VARNISH COMPANY Lacquer has made good under so many and such varied conditions that it has proved itself an outstanding leader in the field. We won't say it's the best lacquer made — but we will say this: It's so good that any lacquer that can beat it has certainly got a real wallop.

The best way to prove it is to test it. You may be reluctant to take our word —but your eyes can hadly fail to credit what they actually see.

"No Tampering with Quality"

The
ROCKFORD VARNISH
Company
ROCKFORD, ILL.

you put the pencil down, pull the line—the quicker the better.

How to Stripe

Some one has said, "He who hesitates is lost." This applies particularly to some of the fellows who jerk on their stripes. Get in the right position for the stripe you wish to draw. Comfort and freedom are half of it, or more. If you are one of those who tries to stripe with a rag in one hand and a pencil in the other—if you are not too old—snap out of it and throw away the rag.

With real stripers that practice was always out of order, but now that lacquer is here, when you put down your brush you may as well move it—and be sure to pull it straight, too! A rag and turpentine won't help you. Perhaps that is why they are offering as much in Detroit for a real striper as they do in New York for plasterers. Judging by the striping on the cheaper cars that I have noticed, there is still plenty of need for real stripers.

Still, striping is easy — provided you develop or have a good eye, a steady nerve, practice and an easy free swing, especially on curves. Did you ever have someone standing near, looking at you stripe, and remark, "How easy it is?" If not, something is wrong with your "technique." You lack the free swing, perhaps. Of course, there is lots more to it if you go into ornamental work and color schemes—contrasts and harmony and all that—but if you become skillful enough to pull a line right, the rest is easy.

White and Gold

White and gold will always be your big runs in colors, but for the customer who wants something rich, carmine glazed over yellow or orange, or ultramarine over gold or light green—these will give fine effects. Two fine lines pulled close together and glazed solid to produce the effect of another colored stripe in center, etc., will always be in demand, but if you can execute an A-1 job with white on black, you can do any of the others. There is enough money in it to make it worth while. Today the demand for high-grade striping is greater than ever before.

All that has been mentioned in this article applies in the main to automobile striping, but at the same time it may be applied to furniture and all other forms of striping. One more thing, especially to the beginner: Start right, and you may as well learn to stripe with either hand. It comes in handy so often it's really worth cultivating. In fact, all of my students are started that way, and while all won't make stripers in service, we figure all will be better for having tried to use all that the Almighty gave them to that end.

Marietta Opens Chicago Warehouse

It is announced that owing to growth of the industrial business of The Marietta Paint & Color Co. among the wood and metal finish users of the Chicago district, arrangements were completed on May 10th for the opening of a Chicago Branch office and warehouse at 616 No. Union Ave.

Mr. William S. Hatten, who for a number of years has been Chicago Sales Manager for the Ault & Wiborg Co., now occupies a similar position with Marietta and will head the Chicago organization.

Mr. Hatten is widely known in the metal and wood-finishing industries throughout Illinois, Wisconsin and Iowa, and is surrounding himself with a strong group of salesmen.

An Important Factor in the Sale of Furniture

The Finish Inside Case Goods

Why compartments inside case goods should be finished smoothly and in harmonizing colors, and what type of finish seems to meet the requirements of good appearance and low cost

By C. M. Burlson

ANYONE WHO visits large furniture stores or the furniture exhibitions and examines the inside as well as the outside finish on furniture, must be impressed with the great improvement that has been made during recent years in finishing of the insides of case goods.

The writer recalls the time when the insides of drawers were, for the most part, left bare. Then the insides of some of the better pieces of furniture were given a coat of glue size and a coat of varnish. This produced a cheap but rough finish. Then we applied a coat of shellac and sandpapered and varnished the insides. This was better but it was costly.

The more expensive goods were oil rubbed on the insides to remove the gloss and give the surfaces a more refined appearance. This also added to the cost. Then someone invented a flat varnish which was suitable for the work. But with shellacing and sandpapering to be done, the cost was still high. Because of the high cost of putting a good finish on the insides of these goods, only the better class received the material and workmanship it deserved.

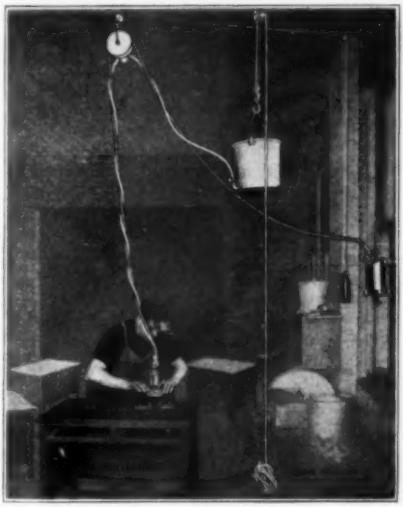
Requirements of Inside Finish

A great deal of attention has been given to this matter quite recently. The demand of the present day is for a good finish inside all case goods, but this finish must be inexpensive. To this end varnish manufacturers have gone in for considerable experimenting. The inside of a piece of furniture should harmonize with the outside finish, but the color of the inside should be somewhat lighter than that of the outside. Manufacturers of inside finishes realize this, and are making these finishing materials in various shades of color to harmonize with any outside finish.

One manufacturer has put on the market a drawer finish which, so far as I know, is as nearly perfect than anything we may have dreamed of a few years ago. The dream of that day was of a finish that could be applied easily and would dry quickly without gloss but with a smooth, velvety feel to the touch. That dream is now realized. The material dries so quickly that when fairly large runs of furniture are being put through, one can start right in after the first coat and apply the second.

One feature of this material is that no previous staining is required; it can be obtained in any

Pneumatic Rubbing Machine vs. Hand Rubbing



THE smooth undercoats must come before the smooth perfect finish—this takes a lot of hard rubbing. The Paasche Superior Pneumatic Rubbing Machine with 1600 reciprocal strokes a minute without any exertion represents a tremendous saving to men who are not afraid of new ideas and methods.

These machines are made in two sizes and are very easy to handle in any position. They are indispensable for sanding, rubbing and polishing. Where modern production methods are in vogue the Paasche Pneumatic Rubbing Machines will increase production at a big saving, which more than pays for the machine in a few months' use. Hook the Paasche Superior Rubbing Machine right on to your regular air line. It is perfectly balanced, built for speed and wear, and its performance is smooth.

There are thousands in use making handsome profits for their users. Write for Bulletin G24.

Paasche Airbrush Co.

1921 Diversey Parkway CHICAGO, ILL.

Factory Branches carrying complete equipment:

Davenport, Ia., 213 W. 2nd St.
San Francisco, 417 Market St.
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The Largest Exclusive Manufacturers of Air Finishing Equipment

IF6-Gray

shade desired and the color is transparent. One of the former difficulties of finishing the insides of drawers to harmonize with the outside finish, was the number of coats necessary to produce a good job. There was the coat of stain followed by two or more coats of finishing material. Frequently the stain raised the grain of the wood so that considerable sanding had to be done. Two coats of the new finish, applied to the bare wood, will produce a good finish, though a third coat will add to the appearance and produce an extra good finish.

The material is applied with the spray which insures a smooth, clean job. It dries to a beautiful flat finish which, for this inside work, is better than an oil-rubbed finish. The time required to properly clean the insides of drawers after an oil-rubbing operation, is so great that there is always a tendency to neglect this part of the work, with the result that the finish looks and feels greasy.

To obtain the best results with this finish (or in fact any finish) the surfaces to be coated should be properly sanded before being sent to the finishing department. Some people have the idea that the insides of furniture drawers and other usable compartments are not important. As a result the sanding in the white is often slighted or done with coarse paper. I do not claim that it is necessary to give the same attention to the inside as to the outside, but the better it is sanded the easier it will be to produce a good finish, regardless of what kind of material is used.

A Selling Point

Those who have not given consideration to this matter can scarcely appreciate the selling value of having furniture drawers and interior compartments well finished on the insides. Many pieces of otherwise good furniture have been turned down merely on account of neglect in this respect. Dealers frequently bring customers to our showrooms to select their furniture, and I have been surprised at the number of women who carefully examine the inside of each piece of furniture to see how it is finished. They will run their fingers over the finish to see if it is smooth; then they open the doors and stand back to see how the inside harmonizes with the outside.

Very few people like to see the inside of a case as dark as the outside. We prefer the lining of our coat to be lighter in color than the outside, and now we examine furniture almost as carefully as we do our wearing apparel. The harmonizing contrast in color gives the article a touch of refinement which appeals to every one—even to those whose tastes are usually indifferent to things esthetic.

Wood Finishing Operations —Sanding

In wood finishing sanding is the foundation to a final smooth finish. The finished product will show whether sanding has been properly done, or just handled in a haphazard way. Today there is not nearly as much sanding required as formerly, but at the same time proper sanding is an important operation in every high-class wood-finishing department.

When an inexperienced young man applies for a job in the fin-

Ed Smith's Page

CAN 2 COATS OF LACQUER EQUAL 3?

WHEN you have been making industrial and other finishes for exactly one hundred years as our firm has, naturally you begin to feel entitled to broadcast a word or two about your achievements.

Right now I want to say something on this widely discussed subject of lacquer finishes—based upon my experience with finishing room problems.

Of course I know that the finishing foreman's first job is to produce the kind of finish that will satisfy himself. Next he hopes to satisfy the big boss from a sales point of view. And finally, he must satisfy his purchasing agent on the vital subject of cost.

Now here's what I am getting at: In the past twelve or fourteen months we have perfected a wood lacquer, which we have found from practical contact with industrial finishing departments, actually will satisfy all three departments in your plant.

This lacquer actually has vastly improved building qualities; it actually does cover a larger area per gallon; it actually will give the average three-coat finish with only two coats. Finally, it costs no more per gallon than the average lacquers; it hits the purchasing department right where it lives.

I want to send you a sample panel of this lacquer. I want you to prove to yourself that it is RIGHT. I want you to examine it with the cold calculating eye of a ruthless critic. I want you to compare it with the finest three-coat job in your shop. If you don't say that our two-coat finish is at least equal to your best three-coat surface you will be a rare exception.

What do you say? Will you send for my panel? No obligation, of course. Simply tear out this page, write your name and address on the margin and mail to me.

Ed Smith

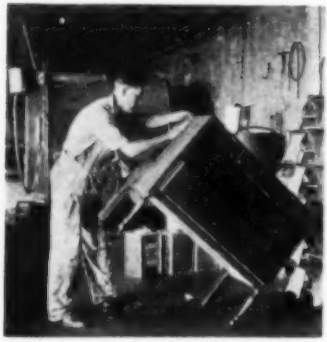
EDWARD SMITH & COMPANY

Makers of Paints and Varnishes for 100 Years

127 West Avenue
Long Island City, N. Y.

ishing room he is invariably put to work sanding. This has been the custom for years because sanding is easy to learn and the beginner is not so apt to spoil as much as he would at some other operation.

There is nothing wrong with the system as I see it, since the apprentice must be started some place, but the trouble lies with certain foremen who do not deem the sanding job of enough importance to give it proper supervision. If the new man is taught right from the beginning and enough time is spent with him every day for two weeks to get him started right, nine times out of ten he will not need much supervision after that.



This operation must not be slighted.

Since the advent of the spray system of finishing, sanding, in most factories, has been cut to a minimum. In the old days we found it necessary to sand after every varnish coat, but now all that is necessary is to sand the filler and shellac coats perfectly, and one doesn't need to sand any of the varnish coats.

In this way the foreman finisher avoids a lot of grief—as for example, having some careless sander cut all the edges white, or scratch and burn up the varnish so that it will show through the last coat. Of course, if dust or dirt settles on some of the work before the varnish has set, these imperfections will have to be sanded out.

Sanding should always be done by making the strokes with the grain of the wood. Do as little "across-grain" sanding as possible and never use a sanding block on finished work.

On undercoats and enamels it is best to sand each coat, because these materials carry a lot of pigment. It often happens that the enamel has not been properly strained and as a result it dries out gritty or pebbly. It is best to use a No. 4/0 sandpaper for sanding undercoats and enamels.

It is well to remember that the first coats, whether they be undercoats or shellac, should be sanded perfectly smooth, for all succeeding coats will be no smoother than the surface of the first coat. This also holds good on wood in the white. If the cabinet work is not sanded smoothly, it is a mistake to think the defects can be covered up by piling on a lot of finish and sanding the varnish coats. As a matter of fact, the finish will tend to magnify any defects in the cabinet work.—Frank Thiel.

Denny, Hilborn & Rosenbach, Inc., New Location of Eastern Sales Office

Owing to increased business in the Metropolitan area, Denny, Hilborn & Rosenbach, Inc. announce removal of their Eastern Sales Office to more commodious quarters, —7-11 East 44th St., New York City—where Mr. Chadwick L. Rowe, Vice President and Eastern Sales Director, is in charge.

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2. Width of spray can be varied from pencil line to three inches.
3. Fan spray may be had in any angle.
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Finishing Wood Handles and Turnings—I

Explaining baked finishing methods and operations, such as preheating of wood, employment of tumbling barrels for applying filler coats and use of dipping process for putting on the finishing coats

By R. L. Masterson

THE FINISHING of wooden handles, show trees, knobs, and similar turnings made of wood has grown into quite a sizeable industry. Prior to the development of heavy bodied nitrocellulose lacquer, which deposit a thick film in one application, such objects were finished either with varnish or oil enamels. Most handles were finished in black and the finish was usually baked to make it hard and marproof. Now, however, lacquer enamels of as many colors as the rainbow, are being used and the varnish and oil enamel finish is on the decline.

The Baked Finish

Wood handles and similar turnings must have a hard, glass-like finish that is not easily scratched or marred. It is for this reason that some of the better finishes were formerly baked. Certain precautions must be observed in the process of finishing wood by the baking method, however, or the results will not be good.

Wood always contains a proportion of moisture and air in the pores and fibers. If this air and moisture are not eliminated before the finishing coats are applied, bubbles and blisters are likely to form in the finish.

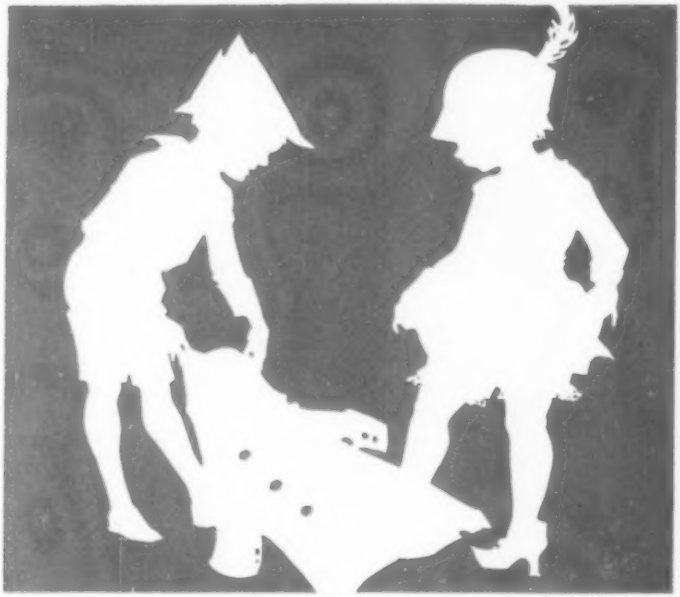
To prevent this trouble it is customary to subject the handles to a preliminary treatment to eliminate the excess moisture and air from the wood. This is usually done by subjecting the bare handles to a baking operation at a temperature slightly in excess of what they will undergo subsequently during the finishing process, and for a sufficient time to be thoroughly dried.

If handles that have been once dried are allowed to lay around for several hours before receiving the first finishing coat, they should be preheated again just prior to finishing to drive off surface moisture that may cause trouble. Wood is hydroscopic, that is, it will take on moisture from the air. Finishing coats, therefore, should be applied as quickly as possible after the preheating operation.

The method of applying bake finishing materials are usually dipping, tumbling or spraying. Brushing is seldom resorted to. The first coats are usually tumbled, as this is the most practical and economical method for small objects. Finishing coats are usually dipped.

In some cases the size and shape of the object is such as to require the finishing materials to be applied by spraying. Spray-

Next month, methods of using air-drying finishes—varnishes, enamels and lacquers—for this work, will be discussed.



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—is just what Glidden men are prepared to offer you in assisting you to meet your finishing problems. ✓ ✓ ✓ We are prepared to make a thorough cooperative study of your needs, make practical suggestions for your finishing schedules, and furnish you with the materials to carry them out correctly. Put in a call today.

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ing gives especially good results on the semi-gloss or flat finishes, as this method of application eliminates streaks and drip-points which sometimes accompany dipping.

Tumbling Barrels

A tumbling barrel for finishing is mounted in such a way that it can be revolved upon an axis. Sometimes one head is removed and the barrel is mounted on an axle tilted at an angle of about 45 degrees. In other cases an axle passes through both heads and the barrel revolves in a horizontal position. In the first instance, turnings are placed in the barrel and removed again through the open end. When the barrel is mounted horizontally, a door is usually provided at the mid length.

Tumbling is employed primarily for applying the first or filler coat. This usually consists of a liquid which contains a large amount of pigment to seal the pores of the wood. Some tumbling fillers are made in such a way as to leave a flat, non-sealing coat on the wood. This allows the moisture to be driven out of the wood during the baking operation, and eliminates the necessity of the preheat operation. It is always safer, however, to preheat and avoid any possibility of the formation of bubbles.

A large quantity of handles or other turnings are placed in the barrel and only a small quantity of filler or other finishing material thrown in with them. The barrel is then started and, as the handles rub against each other, the finishing material is evenly distributed over the surface of the handles.

It is important to avoid putting too much filler in the barrel, as runs or sags may develop. When the handles have tumbled a sufficient length of time for all surfaces to be uniformly coated, they are dumped into a wire basket or some similar receptacle and shaken apart. Then they are baked.

After this filling operation, the handles are given one or more coats of finishing enamel. Sometimes as many as four or five coats are applied to get a very smooth finish. The finishing enamels are usually dipped. For this purpose the handles are generally "pegged" on the points of sharp nails driven through a board, or by some similar arrangement, so that several dozen handles may be dipped at one handling. Each coat should be baked separately for best results. The temperature will vary according to the product being used, but it seldom goes above 225-deg. F.

As a rule, a gloss enamel is employed to build up the finish over the filler coat. Where a dull or semi-gloss finish is wanted, the last coat of enamel is specially designed to give the desired luster when baked.

Colored enamels are more delicate to handle than black enamels, and will not stand baking in excess of 140 to 185-deg. F., depending upon the delicacy of the color.

In the case of paint-brush handles and a few similar objects, a clear baking varnish is sometimes used. It is usually applied by dipping, and two or more coats are put on, depending upon the quality of finish wanted.

A good start makes a good finish. Start your work right; the only way is the right way.

Greenish Tinge In Some Varnished Surfaces—I

First installment of two-part article which explains several causes for the appearance of that characteristic greenish ting, and tells how to prevent this objectionable color in varnish surfaces

By T. E. Moorefield

AT PERIODIC intervals claims are made that certain varnishes show a decided greenish cast on the finished work. It is only natural that often this trouble is first attributed to the varnish itself, because it does not show up until the varnish coats are applied. In the majority of instances, however, a thorough investigation will prove the trouble to have its origin elsewhere.

Usually the greenish cast is not noticed on varnished work until sometime after the final varnish coat has been applied. Even then it may be visible only when the light is reflected from certain angles. This greenish cast is found more frequently on dark colored finishes than where lighter stains are used. It often appears on very dark, red mahogany work.

When the finished surface is held at certain angles, the reflected light gives a greenish tone to the varnish film, which partially clouds the true color of the stain. As the angle at which the light strikes the work is varied, the green tone may be intensified or lightened, or it may entirely disappear at some angles. The color is not a decided grass green, but varies from the faintest trace of green to a prominent yellowish or brownish green, depending somewhat upon the darkness of the varnish itself. A greenish cast is more easily detected in direct sunlight than by ordinary reflected daylight.

There are several causes why a greenish cast may appear in the dried varnish film. Any one of these causes, or a combination of two or more of them, may be responsible for the trouble in an individual case. It is necessary to carefully analyze each problem by itself, eliminating first one cause and then another, in order to definitely locate the offending material, or step in the finishing schedule, and remove it. Some of the more common causes of greenish cast are given in the following paragraphs.

Inadequate Sanding in White

Wood surfaces should always be smoothly sanded before finishing operations begin. If the wood is rough, or has a decided fuzzy surface from raised fibers, it absorbs the stain too much and prevents the stain and filler from being wiped off as clean as it should be. This may lead to a cloudy or green work. It is advisable to sponge the bare wood with hot water, let it dry thoroughly, and then sand smoothly to remove all loose fibers, or "whiskers," before the stain coat is applied. The stain should be applied as promptly as possible after this sanding operation, to prevent the wood from taking on moisture from the air and devel-

"Abraham Lincoln once wrote to a young student, 'If you are resolutely determined to make a lawyer of yourself, the thing is half done already.' Resolutely determined! Doesn't that apply to making goods as well? I believe that half the success of the Murphy Varnish Company is due to its resolute determination to make good finishes."

THIS EASY SANDING FLAT LACQUER
saves labor costs

We have developed Murphy Kauriol Flat Lacquer No. 1 to save sanding labor on furniture and cabinet work. You can now secure a beautiful mat finish with much greater ease and speed than has ever before been possible with a flat lacquer.

You do not even have to use sandpaper wet with water or oil—ordinary dry sandpaper knocks the nubs off into a powder. The resulting finish is desirable in every respect. Durability has not been sacrificed to obtain this unusual ease of sanding. Three coats give a perfectly satisfactory surface —four coats may be used for a superfine job.

This material goes particularly well over Murphy Kauriol Wood Preparation, our pyroxylin filler and stain, but may be used over other fillers with satisfactory results.

We should be pleased to have one of our representatives call and demonstrate this easy sanding flat lacquer to you.

Murphy
KAURIOL FLAT NO. 1 **Lacquer**

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oping a rough surface or "raised grain" effect again.

Glue Through Thin Veneer

With hardwood veneer cut so very thin, as they are today, and with careless gluing methods, much glue comes through the pores of the veneer. Even when hot water is used to sponge the wood before staining, all of the glue may not be removed from the surface pores.

Occasionally, on the dark finishes, a cloudy or smoky effect develops with age, and when viewed from certain angles, it shows a decided greenish cast. This condition may not be regular or uniform over the surface but may show only in spots or streaks. It is considered to be the result of a chemical action between the stain, or filler, and the glue in the pores of the wood.

It is advisable to take such steps as may be necessary to prevent an excess of glue in the pores of the veneer, for it should be remembered that when there is glue in the pores, the finish is built up on glue instead of wood, and there is danger of serious trouble developing in the finish.

Stain Too Strong

When stain is used too strong, a certain proportion of the color will penetrate the wood, but much of it will remain on the surface. Red mahogany water stains often leave a decided bronze-colored appearance to the surface when dry, if applied in too concentrated form. If this excess color is not removed, a greenish cast is likely to develop in the finish. This bronze cast may be removed by wiping up the excess stain before it is dry, or by sponging the work with a cheesecloth slightly dampened in alcohol.

The proper remedy for such troubles is to make sure that the stain is free from insoluble matter, and to apply only as strong a solution as may be required to get the desired shade. The stain should be carefully strained before application. Many finishers add about one ounce of powdered alum to each gallon of stain, to bring the undissolved matter to the top of the stain and thus aid in straining.

If the desired color happens to be so dark as to require a strong concentration of stain, it is better to use the stain in a weaker form, and depend upon a tinted coat of shellac, or a tinted coat of varnish, to help secure the final color. A still better method would be to secure a different stain powder which has a darker tone, or a stronger staining power, and reduce the quantity of powder used in each gallon of water.

Under ordinary circumstances it should never be necessary to use more than 4 to 6-oz. of stain powder to each gallon of water, if the proper stain powder is being used. A larger proportion than this is likely to lay on top of the wood and result in a greenish cast.

Shellac Over Stain

Spongy woods, such as mahogany, should always receive a thin coat of white shellac over the coat of water stain, to bind down and stiffen the loose fibers of wood, so the sanding operation will cut them off smoothly. One part of 4-lb. cut white shellac, mixed with seven or eight parts of denatured alcohol, is about the right mixture for this purpose. This shellac coat should be dried at least five hours and preferably

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Flint Lacquer Primer

A Lacquer foundation for a Lacquer finish.

Troubles caused by the use of shellac and shellac substitutes are eliminated because, being a pyroxylin material, it knits perfectly with the succeeding coats of lacquer.

Dries quickly and sands easily—yet is elastic and durable.

Foremost manufacturers of case goods, tables, chairs, radio cabinets, etc., have adopted *Flint Lacquer Primer* as their standard first coater for clear lacquer.

Place a trial order and convince yourself that **Flint Lacquer Primer** is the correct foundation for your Lacquer finish.

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LONG ISLAND CITY, NEW YORK

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longer; then sanded smoothly with fine sandpaper.

Orange shellac is not as clear nor transparent as white shellac, and should not be used where the clearest tones are wanted. Certain kinds of shellac substitutes should be avoided. Pure white shellac will always be found satisfactory.

Many instances have been observed where a coat of shellac or shellac substitute, applied over the filler, had cut into the filler and stain in such a way as to take up some of the color. This created a condition that brought out a bronze-green cast when the surface was finished. This can be corrected only by thoroughly analyzing the staining and filling processes to determine what should be done in the way of changing the stain or filler, or the methods followed, to avoid the defective work.

(To be continued)

Why Piano Varnish Checked

A matter that recently came to the attention of the writer was that of a piano, certain parts of which showed the varnish literally filled with fine checks. Though all parts of the case had been finished alike, they had not all been affected in the same way. For instance, the varnish on the underside of the top and fallboard had lost but little of its luster, and was not in the least checked.

There was no evidence that exposed parts of the piano had been subjected to dampness, extreme heat or the direct rays of the sun; in fact there was evidence that none of these things had taken place. The conclusion that the varnish was at fault, was reached, in this case, on the following grounds:

Varnish does not dry by the process of evaporation so much as by oxidation; that is, certain of the oils or parts of them evaporate, but the hardening of the varnish is the result of absorption of oxygen from the air. When one understands this he will also readily understand that the more freely the air circulates over the varnish surface, the more rapidly will the varnish harden, or oxidate—everything else being equal.

Two things are to be remembered in investigating a matter of this kind. The life of any oil, suitable for use in a high-grade varnish, is almost infinite when not exposed to the elements, its life is much longer than is that of the gum which gives the varnish its body and its brilliancy.

Remembering these points, in connection with the fact that, in the case cited, the parts of the piano most exposed to the free circulation of air showed the most deterioration, and that the piano had been finished not longer than three years, we were forced to the conclusion that the varnish was either short in oil, or the oil used was of very poor quality. We preferred to believe the former. In other words, the durability of the varnish had been sacrificed to a more brilliant but shorter life.—C. B. Murell.

In all finishes, the importance of undercoats drying properly before the application of top coats cannot be emphasized too strongly. The drying of the top coat over an improperly dried undercoat may cause cracking. This is caused by the contraction of the drying top coat.

"Wears like Flint"

FOR nearly fifty years this familiar trade mark has stood as a guarantee of quality among critical users of finishing materials.

We make a complete line, but *because of their outstanding excellence*, want now to call particular attention to only two general products, viz.;

1st **Pharaoh Lacquers, Clear and Rubbed Effect**—Flat, Velvet, Semi-Bright.

Cleveco XXX Lacquers,
Colors and Under-coatings.

2nd **Paragon Rubbed Effect Varnishes**—
Flat, Velvet, Semi-Bright.

Regardless of what you are using, unless it is our own goods, we are prepared to show you a decided advantage in any side by side comparison.

We are also prepared to furnish intelligent and experienced finishing department helps, along with our goods.

Your problems are our business.

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3. Exceptional covering capacity with a minimum material cost;
4. An even flow and smooth surface free of bubbles, orange peel or blushing;
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The reason manufacturers, in widely varying industries, have given emphatic preference for Opex, is the tougher, richer, heavier protective film which it imparts to the products they make.

These advantages are found in Opex, largely because this lacquer enamel contains a greater percentage of higher grade nitro-cotton and gums *rightly proportioned*, and because of higher boiling point solvents.

If you will submit your problems to our experts, they will be glad to work with you in an effort to produce better results at no more cost.

THE SHERWIN-WILLIAMS CO.
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Lacquer has its place Varnish has its place

This is admittedly a "lacquer age" but lacquer, like everything else, has its place. To use it out of its place means false economy and lower profits.

There is still a place for *Varnish* and we have the *Varnish* for the place.

Hundreds of furniture manufacturers are using our varnishes on products embracing all the various pieces and suites necessary to furnish the home.

The fact that we are continually adding new customers to our list bears out our statement that there is still a place for varnish.

At this time we are concentrating our efforts on two particular varnishes which we heartily recommend for all kinds of furniture—

Our CRYSTAL RUBBING produces either an excellent dull rubbed or polished finish at a low cost.

While our **DURABLE COACH** is unsurpassed for producing a high gloss.

Working sample on request. Both these varnishes will spray or brush.

If you want a varnish that offers the most for the money (real economy) better try ours. We are varnish specialists—have been at the game since 1870.

Indianapolis Varnish Co.

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Indianapolis, Indiana.

Excerpts from paper presented at the meeting of Retail Delivery Equipment Association at Hotel Sherman, Chicago, April 1927, by Vice-President and chief chemist of Valentine & Co.

Commercial Vehicle Finishing

By L. Valentine Pulsifer

THE DEVELOPMENT of vehicle finishes in the last 25 years has been fully as astounding as the development in the vehicles themselves.

Automobile Lacquers

Briefly, nitrocellulose is cotton which has been treated with nitric acid and thereby rendered soluble in certain solvents and has also undergone a marked change in its inflammability. . . . The simplest form of nitrocellulose lacquer, namely the solution of one grade of soluble cotton in a simple solvent, is as different from a complete and properly balanced automobile lacquer as a one-room, one-man, one-product shop is from a full-size department store.

A scientifically constructed automobile lacquer consists of six or seven different types of materials: (1) Soluble nitrated cotton—frequently several types for the same lacquer; (2) solvents; (3) non-solvents; (4) diluents; (5) plasticizers or softeners—either volatile or non-volatile; (6) resins or gums of various types—both natural and synthetic; (7) pigments of every conceivable type and color.

It will readily be appreciated that the proper combination of this complex solution of materials, to produce the best results in a given lacquer, is a job that only the manufacturer completely equipped, as to technical and scientific organization, can successfully accomplish.

Lacquers Dry by Evaporation

Nitrocellulose lacquers have this fundamental difference from oil- or varnish-type paints: They dry, i. e., become hard by evaporation and not by oxidation. Thus, as soon as the volatile materials—the solvents, non-solvents and diluents—have evaporated, the finish is dry. This takes minutes, as against hours for the slow process of oxidation to change the old type materials from liquid to solids.

Their rapidity of drying makes it necessary to apply them with an air brush—with the exception of brushing and striping lacquers specially adapted to brushing—and their non-oxidizing quality

promotes their durability, especially in their pigmented form by which the destructive actinic or chemical rays in sunlight are kept out of the film.

Lacquer Not a Cure-All

Now what does all this mass of more or less mysterious material mean to the man who is trying to keep his delivery vehicles on the street and looking their best—for the selling value of beautifully finished equipment is fully realized by every up-to-date store? It means that a wholly new type of finish is available, as different from the old type as an automobile is from a horse and wagon—a new type of finish which should be carefully studied to discover its proper place in the finishing scheme for delivery vehicles.

Examples of the Seven Main Types of Nitrocellulose-Lacquer Materials

1—Nitrated Cotton	½ Second Cotton ½ Sec. Cot. Sol. High V. Cot. H. V. Cot. Sol.
2—Solvents	Butyl Acetate Acetone Ethyl Lactate
3—Non-Solvents	Ethyl Alcohol Butyl Alcohol
4—Diluents	Toluol Zylol
5—Plasticizers	Castor Oil Dibutyl-phthalate Tri-cresyl phosphate
6—Resins	Shellac Kauri Gum Ester Gum
7—Pigments	Titanox Chinese Blue Para Red

Nitrocellulose is not a cure-all for every finishing problem. It is a new and wonderfully interesting tool to work with in building new paint systems, sometimes by itself and sometimes in combination with both old and wholly new adaptations of the oxidizing finishing materials. It also means that, urged on by this nitrocellulose speed, certain of the older-type varnish materials have been improved and accelerated to furnish a speed and service undreamed of a few years ago.

Two General Lacquer Systems

Nitrocellulose finishing systems are of two general types; either complete-nitrocellulose or composite, the latter consisting of one or more types of oxidizing undercoats followed by nitrocellulose top coats. Of course, the maximum in speed and durability is naturally obtained by the complete nitrocellulose system, but the complex nature of many vehicles, affording as they frequently do wood, composition and metal surfaces all in the same vehicle, makes the composite system frequently more desirable and in many cases, points to the use of the latest development in varnish or oxidizing-type finish. As the simplest way of explaining these various types of finish, I am showing panels illustrating the systems of application, coat by coat.

Simplest Nitrocellulose System

The first panel shows the simplest and quickest complete-nitrocellulose system—for use on simple metal surfaces and where a high-gloss finish is not desired. The system consists of five coats and can be readily applied in half a working day.

The nitrocellulose primer is followed in 15 or 20 min. by a full coat of nitrocellulose glaze which is allowed an hour or two to dry and then is lightly scuff sanded;

Dr. Willson's Dust and Spray Mask

Built to Give Lasting Comfort and Protection at All Spraying Work

Here is a durable, light-weight, comfortable breathing mask that fits anybody. Does not interfere with vision. You'll like it.

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Largest plant in the world manufacturing safety goggles, dust and spray masks, and welding helmets and handshields.

three coats of nitrocellulose enamel are sprayed on, the spraying of each coat following immediately after the preceding one. An hour after the last enamel coat is applied, the vehicle can be run out on the street—a simplicity of process and a speed of application never before approached. And this in a system affording the extreme of durability!

Polished All-Lacquer Finish

The second panel shows a complete-nitrocellulose system of the highly developed type—with a final high polish—which may be readily applied on metal surfaces in two days and polished on the third day. The nitrocellulose primer and two or more coats as needed of the nitrocellulose glaze are applied the first day; on the second day the surfacer coats are sanded down smooth with water and sandpaper, or with a rubbing block; the enamel coats, usually four in number, are applied one immediately after the other; on the third day the vehicle is polished and striped.

This system is used in finishing many of the finest automobiles both here and abroad, and lends itself perhaps more readily to production finishing than to the refinishing of delivery vehicles. In the complete-nitrocellulose system, each coat partly dissolves and amalgamates with the preceding coat and the completed finish is literally welded together into an inseparable film.

A Composite Finishing System

The application of nitrocellulose finishes directly over old painted and varnished vehicle surfaces is not recommended as the result is bound to be a gamble, dependent on the condition of the old coats. The third panel shows a composite finish consisting of oxidized undercoats followed by polished nitrocellulose enamel. This is the nitrocellulose system which, by its adaptability to various types of surfaces, is most applicable to the refinishing of delivery vehicles where either a polished or satin-gloss nitrocellulose finish is desired.

In this system, after the proper preparation of the surface, a coat of air-drying primer is sprayed on—brushed on in the case of wood or composition surfaces to insure greater penetration. This coat is followed in three to four hours with a spray coat of air-drying surfacer repeated in another three hours if needed. These undercoats are allowed to dry overnight, are then sanded down with waterproof sandpaper, the moisture allowed to dry off and then the necessary number of coats of nitrocellulose enamel, usually four, are sprayed on.

Oil Undercoats Must Be Dry

In order to withstand successfully the solvents in the enamel, the oxidizing undercoats must have dried hard enough to be practically insoluble in these solvents. This has been a difficult condition to meet and, at the same time, to afford the required speed of drying, adequate elasticity and durability. In production shops these oil-type undercoats when used are invariably baked, insuring both speed and hardness. Refinishing shops do not ordinarily possess baking equipment of this type, nor will completed vehicles stand the temperature commonly used.

The materials used as undercoats in this system are the result of long research looking to-

We can help you in the development of new finishes. We are equipped to render this service in the most advantageous manner for you.

Our method of Brown Lacquer Glazing makes the antiquing of furniture an easy operation. This method followed by our GRAVARCO 1009 *Clear Lacquer* and GRAVARCO 1022 *Flat Lacquer* produces a most durable and economical finish in addition to giving you a delightful softness of tone so desired.

What is your problem?

GRAND RAPIDS VARNISH CORPORATION

Main Offices and Source—Grand Rapids, Michigan

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ward the production of suitable air-drying (non-baking) undercoats for use under nitrocellulose enamels, that would combine the qualities of fast drying, adequate insolubility and ample durability. These materials practically place the refinishing shop on a par with the production plant equipped as it is with baking apparatus and working on unmounted metal bodies. The third day this enamel is polished to a high luster with abrasive polish.

Over an old surface of varnish or paint, this system may be applied successfully in a slightly different form. One or more coats of a material combining the properties of the primer and surfacer mentioned above are applied after the old surface is properly prepared. This is allowed to dry overnight, then sanded smooth with waterproof sandpaper and finished with nitrocellulose enamel, which is polished the following day in the usual manner.

A Four-Hour Rubbing Varnish!

All are doubtless more or less familiar with the oil or varnish types of finish in their usual forms, but I have here an example of the latest development in systems of the oxidizing type, combining speed with durability in a manner wholly new. The undercoats in this system are the same as described in the case of the composite system.

One priming coat followed by one or two surfacer coats are applied the first day. On the second day the surfacer is water sanded smooth, dried off, and a coat of japan ground color is applied. This coat is allowed about an hour to dry and is then followed by a 4-hour rubbing varnish—in color-varnish form. This is a recent development in varnish making and, in spite of drying in 20 hours less than the usual "quick rubbing" varnish, it works and flows easily and has first-class durability.

After drying four hours this varnish is rubbed down with powdered pumice stone and water. A coat of finishing varnish, resembling a spar varnish in speed, toughness and durability, is applied. The latter dries hard enough overnight for the vehicle to be put in service the following morning. Thus a complete oxidizing-type system, consisting of six coats and affording great durability and beauty of finish has been applied in two working days!

Many Factors to Be Considered

These four systems briefly described and illustrated by these panels give you a bird's-eye view of the latest possibilities in the finishing and refinishing of delivery vehicles. The type to be selected depends on many factors, and these factors are frequently different from those important in general automobile painting.

The elaborate lettering and decoration which are frequently used on delivery vehicles, almost demands a clear varnish finish, though the undercoats may be nitrocellulose if desired. Also, there is difficulty in bringing the large flat panel surfaces of a delivery wagon to a uniform and adequate polish even approaching in luster a varnish finish. Durable, high-luster, clear nitrocellulose lacquers for use over colored nitrocellulose lacquers have yet to be developed, although clear lacquers of great durability for use on natural wood are available.

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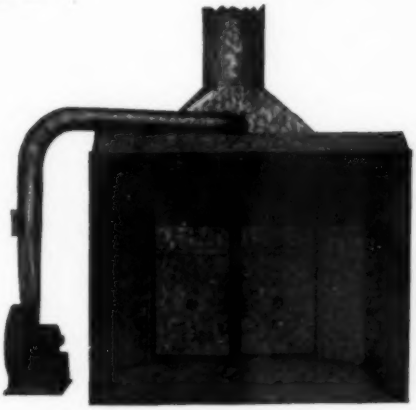

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If you would like one of our representatives to call—or want advice on any special finishing problem—a letter to the New York office will get immediate attention.

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Selecting a Finishing System

On the other hand, the ease and quickness of repair to damaged panels or parts, where a nitrocellulose finish has been used, is a valuable asset in keeping vehicles on the road.

The technical experts of companies manufacturing finishing materials know the desirable properties of their materials and they should be consulted in selecting the systems to be used for different classes of work. Then specifications should be drawn up for each type of finishing and refinishing job.

Paint System Should Be "Engineered"

The selection of the right system and the specification of the right methods and materials are absolutely necessary for uniformly successful results. Remember that nowhere are cheap or inferior materials such false economy as in vehicle finishing or refinishing, because labor and other charges are at least several hundred percent greater than the material cost.

Remember that there is no more reason for a paint system to "fall down" than there is for a modern steel skyscraper to collapse, provided the knowledge available regarding paint materials and their proper application is intelligently used. Care in the selection of the proper system for the work in hand, in the writing of the detailed specifications for the material and its application, and in the purchase of the right products, will more than repay the trouble taken to do the whole job right.

Commercial bodies in production in paint shop.

Industrial Finishing

PRACTICAL PUBLICATIONS, INC.
Publishers
Room 603, 222 E. Ohio St.
Indianapolis, Ind.

Issued monthly. Distributed exclusively to executives and foremen finishers in all kinds of industrial plants where finish coats are applied.

EDITORIAL

First Step in Reducing Finishing Costs

The management of every manufacturing concern is interested in reducing costs—particularly finishing costs—and production managers do not hesitate to impress this fact upon foremen in charge of finishing. But very often a searching investigation will reveal the fact that the first step in reducing finishing costs can be profitably taken in departments that come before finishing.

This suggestion is not meant to encourage foremen finishers to acquire that disagreeable habit of "passing the buck," but it is intended to point to the need of finding out the true conditions and then applying such remedies as logical reasoning dictates. This suggestion applies in both wood and metal finishing—in wood finishing particularly, since wood surfaces are subject to more causes for trouble.

Wood surfaces, bruised by imperfect machine work, give finishers much trouble and extra work, because the bruised places may not show up until after stain is applied. Rain blown through a window or any kind of liquid drippings upon wood in the white, will mean extra work for the finisher; likewise, veneer laid wrong side up, or used too thin or laid over imperfectly machined core wood. Glue sizing, open nail holes, oil and sweat stains, etc., are among the common causes for extra time and labor being spent in the wood-finishing department. These things should be investigated and checked up as a preliminary step toward effecting a substantial cost reduction in the finishing department.

The preparation of metal surfaces for finishing with paint, enamel, varnish or lacquer will also bear investigation. A clean surface—meaning a surface free from rust, sand, grease, chemical cleaner, moisture, etc.—is an essential requirement for economical and satisfactory metal finishing. Smoothness of the surface, according to the class of work, is also necessary.

Management is reminded that reasonable low finishing costs cannot prevail when the finishing department is obliged to utilize part of its time and floor space doctoring up defects and fixing up slighted work for which other departments are really responsible. Every operation that precedes finishing and which may affect the surface in any way must be performed *right* to pave the way properly for economical and satisfactory finishing.

The safest and most economical practice calls for the keeping of lacquer materials in tightly-covered containers when not in use.

"Stands for Durability"

DURO finishes represent a standard, recognized line of Enamels, Lacquers and Undercoatings that have won an enviable reputation for quality in nationally known furniture lines.

BACK of DURO Finishes—a new and modern factory, a well-trained and skilled organization, color harmony and design advisory service, and traveling representatives who know correct finishing and progressive handling methods.

We solicit your inquiries.

O'Neil Duro Company

Established 1893

884 Greenbush Street Milwaukee, Wis.

How to Keep It Looking New

The general public has been reading, seeing and hearing much about fine and colorful finishes in the past two years and as a result public interest has been stimulated in, first—getting good finishes, and second—keeping the finishes on new articles looking new. Manufacturers of motor cars — always progressive and ever eager to win and keep the good will of the motoring public —have sensed the motorist's desire to keep the new car looking its best for as long a time as possible, and have taken the opportunity to inform buyers how to treat the original "paint job" from time to time, so it will retain its original luster and beauty. This preservation of the original finish is a splendid advertisement for both the car and the manufacturer of the finish.

Manufacturers in other industries—for example the furniture industry—could carry out something of this kind to good advantage and it would reflect both to their credit and to the credit of the kind of finish used on their goods. Furniture is a highly competitive line and it is the leaders in new ideas that are getting the greater percentage of desirable business.

Dealers and the buying public are more interested than ever before in attractive and durable finishes on furniture. When furniture is purchased and placed in service, the owner desires that it retain its original luster and beauty of finish. He wants to know the what, how and when to use to get this result. It is the furniture manufacturer's opportunity—and shall we say, duty—to tell him. Probably a printed slip attached permanently to some inside part of the article, or a card in a pocket, would be a suitable vehicle to carry the message.

Put On An Exhibition Finish

It is an established fact that today the majority of buyers are decidedly critical in their inspection of finished articles. The typical buyer first surveys an article in a general way for design, color and finished surface; then he steps up for closer inspection. Here is where that bit of extra time and care spent or omitted to make the article perfect in detail and free from flaws, often makes or loses the sale.

With competition keen and a "buyer's market" prevailing, those trifling details in the final appearance become vitally important. Wise manufacturers no longer count it an extravagance to spend all that is necessary to "doll up" their products with an "exhibition finish". Wise retail dealers know the sales value of that exhibition finish and they spare no expense to maintain their goods in perfect condition until it is sold.

A careful checking up, by manufacturers who go in for investigation promptly when sales fall below the customary or expected volume, has disclosed numerous cases wherein one of the outstanding causes for decreased sales lay in the presence of slight imperfections and defects, which had been either unnoticed or passed over as too insignificant to merit a going over.

Evaporation from the materials used in spraying lacquers are, as a rule, greater than in brushing goods.

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For actual economy in the finishing room, plus quality, piano varnishes manufactured by the Boston Varnish Company stand alone. Piano Polishing Varnishes are tested varnishes, made expressly for the use of piano manufacturers.

They are non-checking—will not check in winter or summer. They are non-shrinking. They have great elasticity. They can be sprayed direct from the drum. And they give an extremely high "piano polish."

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Questions and Answers

This service department is conducted to meet the readers' need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer comments, suggestions or answers

Air-drying Crackle Finish

We have designed a line of garage testing equipment in which we desire to finish the sheet metal housings in a "crackle" or similar finish. Because of fire insurance, the owners of our loft will not permit us to install a furnace, so are wondering if there is any process which can be used to produce such a finish without heat.—G. H. A.

Heat is not necessary for producing a crackle finish if air-drying nitro-cellulose lacquers are used for all coats in this type of finish.

In brief, the crackle finish is produced by applying a coat of lacquer either colored or clear next to the uncoated surface and after this is dry, a coat of crackle lacquer of desired color is sprayed on. The crackle lacquer coat breaks apart into innumerable cracks showing through the color of the undercoat lacquer used or, in case clear lacquer is used for the undercoat, the color of the unfinished surface of the metal or wood, is revealed.

When the crackle lacquer coat is dried thoroughly it is protected by one or more coats of clear lacquer.—I. F.

Lacquer Blushing in Summer

You have published articles from time to time in your very helpful publication INDUSTRIAL FINISHING regarding blushing, but none of these have seemed to cover our particular problem.

We manufacture self-contained automatic storage heaters, the outer jacket of which is terne plate. These jackets are sprayed with clear nitrocellulose lacquer (of a nationally advertised firm whose products are extensively used in the automotive industry) to which is added aluminum bronze powder. Two coats of this lacquer containing aluminum bronze powder are sprayed one day, and the second day, two coats of clear lacquer without the aluminum bronze powder are applied.

During the season of the year that our plant is heated, we have no difficulty with blushing, but from this time of the year to about the first of November when the relative humidity is above 60-deg., we have continual trouble. For the past two seasons we have been heating our spray room during the spring, summer, and fall months. To do this, however, it necessitates our using a large heating boiler to supply heat for one room only, and it is rather costly.

We are wondering if you could suggest any method of applying this material that would eliminate the necessity of heat. We have had the matter up with the manufacturers of the lacquer (they don't call it "lacquer") but they tell us that in buying the highest quality of material available, as we are doing, we are

Here Are Facts You Should Know About

BERRY'S CRYSTALLIZING BAKING JAPAN

GET acquainted with this important new product—Berry Brothers' Crystallizing Baking Japan.

One coat covers bare metal and produces a beautiful, durable and smooth finish.

It handles as easily as black japan and may be obtained in almost any color or clear.

This product may be used on any metal surface. It is especially valuable as a solution of the finishing problem for manufacturers of fittings, fixtures and metal specialties.

Full information, samples and prices on request

BERRY BROTHERS INC.
Varnishes Enamels Stains
Walkerville, Ont. Detroit, Mich.

overcoming this condition to the greatest extent possible. At various times we have added a retarder to our finishing material but have found that this, too, is only a makeshift.

Your co-operation in this matter will be very greatly appreciated.—E. H. H. Co.

Unless you are located in a most unusual place—one where the humidity is very excessive—the use of the proper thinner should eliminate blushing troubles. This thinner should be essentially of the high-boiling solvent or retarder type and should give a clear coat under any but the most extraordinary humidity conditions.

The thinner can either be mixed with the lacquer or sprayed over the finished job after it has blushed. A thin mist of high-grade reducer, sprayed over a blushed surface, will almost invariably clear it up.

Of course, a heated, well-ventilated spraying room is the ideal condition under which to work, but if this is impractical—and it seems to the writer that to obtain a sufficiently dry room on a hot humid summer day, the temperature inside will most likely be almost unbearable to the men—the use of high-boiling retarder solvents, properly proportioned, is unquestionably the next best solution to your problem.—S. P. Wilson.

Finishing Incubators

What would be the process in finishing incubators, indoor and outdoor brooders? What materials should be used for finishing egg trays and the inside? This is a prospective job I am looking up and I would like to inform myself on any peculiarities of that particular work. Am presuming the inside would have to be a moisture proof material, the outside well sealed and moisture proof, and the entire work based on a very economical finish.—I. R. S.

One of the most commonly used systems for finishing incubators, brooders, and similar articles is to prime the wood with a good waterproof pigment primer, which is a liquid material containing transparent pigments.

When this is dried overnight, one or more coats of a good grade of spar varnish should be applied. The egg trays and the inside should be finished the same as the outside for best results. The transparent pigment primer seals the pores of the wood and the spar varnish produces a moisture proof finish.

If the finish is desired to be a solid color, one or more coats of a good grade of enamel can be used to replace the spar varnish coats referred to above.—I. F.

Mahogany Grain and Color on Aluminum

I would like some information on how to finish a mahogany grain finish on a piece of aluminum metal to produce a high gloss, and also a dull gloss.—H. N. L.

To produce a mahogany grain finish on a piece of aluminum metal, it is necessary to prime the metal with a primer of the proper shade to serve as a ground color for the finished work. The shade may vary from a vermilion to a reddish brown, depending up-

When COMPETITION *is a Factor*

A rubbed effect with Flat Duco

WHERE price of the finished article demands economy—there is a material saving in labor by using Flat Duco for legs of tables and ends of some pieces of furniture.

Flat Duco will give a rubbed effect—and mixed with Duco will permit any degree of lustre or dullness to be obtained.

Many manufacturers have successfully cut finishing costs by this method. Write for full information or try a 5-gallon sample can.

For full data about the du Pont Industrial Finishing Service, and other information concerning the du Pont line, write to E. I. du Pont de Nemours & Co., Inc., Chemical Products Division, Parlin, N. J., Chicago, Ill., San Francisco, Cal., Everett, Mass., or Flint Paint and Varnish Limited, Toronto, Canada.

DU PONT

on whether a red mahogany or a brown mahogany finish is wanted.

This priming coat can be in the nature of an air-drying paint primer, a baking paint primer, or a nitro-cellulose lacquer enamel. The baking paint primer will probably give better adhesion to the metal than either of the other two types of primer.

After the primer or ground coat is dry it is necessary to apply a coat of graining ink, which can be made by reducing japan colors or oil colors with turpentine to a thin consistency. Black or real dark shades of brown are usually used for producing the grain on imitation mahogany work. As soon as this graining coat has been applied it should be grained out with a graining brush or other tool, to imitate as closely as possible the grained effect of dark mahogany.

Experience is the only teacher of how to do this hand graining. Plates are now available on which the reproduction of the grain of any kind of wood is employed and, by passing a gelatin roller over this plate, the grain of the wood can be picked up and transferred to any metal surface which is to be finished in the imitation wood effect.

Regardless of which method of producing the grain is used, the grain color should be allowed to dry thoroughly hard and be finished over with one or more coats of varnish or lacquer. These finishing materials usually give a high luster, but where a dull gloss is wanted, they can be rubbed with pumice stone and oil to a dull finish, or a coat of flat-drying varnish or lacquer can be applied after the last coat.—I. F.

LACQUERS for Wood

Pioneers in wood lacquers that give a finish that lasts. Made to satisfy users for sixty-nine years. Write us your requirements.

Chas. Cooper & Co.

90 Worth St., New York

Works—Newark, N. J. Since 1857

Walnut Stain for Other Wood

I would like to ask some readers of INDUSTRIAL FINISHING to give me a formula for the present-day walnut stain, to be used on other woods than walnut. It is desired that this stain be an alcohol stain.—Bloomfield.

I do not quite understand what you mean by "The present-day walnut stain," to be used on other woods. If you mean French or Huguenot walnut, these can not be made successfully on woods other than walnut. If you mean high-lighted walnut, this can be made with any of the walnut stains on the market. It is not the kind of stain used so much as the method of applying it, that gives the high-lighted effect.

If the stain is applied with a brush, the method is to first apply a light coat of stain to the whole surface; when this is dry apply a coat of darker stain around the edges, and just before this is dry, work it towards the center with a blending brush.

If the stain is applied with a spray, the method is to apply a light coat over the whole surface; when this is dry apply a second coat around the border, or where the darker shade is desired. The main thing is to see that the second coat of stain tapers out gradually to nothing toward the cen-

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IV. It is SAFE SOLVENT for ALL working conditions.

V. The use of Pent-Acetate in your lacquer will improve its quality—hence more sales.

VI. You have an assured supply on a reasonable non - fluctuating price basis.

In making tests as to quality and cost—remember Pent-Acetate is the NEW standard. Compare its evaporation rate with other higher boilers. Higher boiling does not always mean slower evaporation. Pent-Acetate best covers the range of medium and high boiling solvents.

SAFE SOLVENTS FOR SHARPLES TRADE MARK SOLVENTS ALL WORKING CONDITIONS

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ter; this can be done with the spray.

Your reason for using an alcohol stain is not quite clear. Perhaps it is because it raises the grain less than a water stain. Water stains can be made so that they will raise the grain less than alcohol stains. To make a water stain of this kind, first dissolve 1-oz. and 60 grains of dried carbonate of soda in 1-gal. of water, then add ½-lb. of bleached shellac. The water should be heated to a temperature of 175-deg. F. first; after the carbonate of soda is dissolved, pour the shellac into it slowly and stir until it too is dissolved. Be sure you use carbonate of soda—not baking soda, nor washing soda.

The stain to which the above solution is to be added should be made twice as dark as it is intended to be used, because the addition of carbonate of soda solution will reduce it. Thus, if you are using a stain made in the proportions of 4-oz. powder to 1-gal. of water, you make the stain 8-oz. to the gallon, which will give you the proportions of 4-oz. to the gallon when the first solution is added.

Do not use a spirit stain powder for this stain; use a powder that is soluble in water only. Powders soluble in spirits are not successful in this combination.—W. J. Kitely.

LACQUERS for Autos

Extensively used, free from gum, uniform, reliable and economic. Pioneer lacquer makers who can satisfy your requirements. Write for prices.

Chas. Cooper & Co.

90 Worth St., New York

Works—Newark, N. J. Since 1857

Keeping Inlays Light

Will you kindly advise me what method is used, or methods are used, to keep light wood inlays from taking mahogany stain when the latter is applied to mahogany furniture with these light colored inlays?

We are making pieces that must have quite a dark mahogany stain applied to get the shade wanted. These pieces have long narrow inlaid lines of maple or satinwood. If we stain before gluing in inlay, the stain is scraped off the mahogany when the inlay is worked down flush. If we stain after inlay is glued in, we find it very difficult to keep the inlay from becoming darkened by the stain. What is the best way to get any degree of darkness wanted on the mahogany, by staining, and at the same time have the inlay stand out clear and unstained?—H. E. C.

It is customary to shellac the light-colored inlay wood which you wish to take no stain. Then, after staining, you can easily wipe the stain all off the shellaced surfaces.

Different degrees of darkness of mahogany stain are obtained by varying the strength of the stain.—I. F.

Wood Fillers and Lacquers

Nitro-cellulose for the furniture trade is in its infancy in Australia, and we, as lacquer manufacturers, receive many queries from wood finishers. In particular we should be glad if you could give us information concerning the ingredients and proportions for satisfactory wood fillers. Raw materials for these fillers are not always available

CURTIS COMPRESSORS. HOISTS. CRANES. CAR WASH SYSTEMS. PORTABLE COMPRESSOR UNITS

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THROUGHOUT the country, leading manufacturers of paint spray equipment use or recommend Curtis Air Compressors. They want their devices to work to the best advantage and picked Curtis because:

They know that an oil clogged filter means "oil in the paint" and that, with Curtis *Controlled* Splash Lubrication, filters need attention much less frequently.

They know that each Curtis Compressor is made with all the care and precision that goes into the building of a fine automobile.

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CURTIS COMPRESSORS

CURTIS PNEUMATIC MACHINERY COMPANY, ST. LOUIS, U.S.A.

Kindly mention INDUSTRIAL FINISHING when writing advertisers

in Australia—for instance, we are not able to locate a reliable source of supply for silex as yet.

There is much controversy concerning the correct procedure for wood finishing with lacquer. Some favor the method of rubbing down with abrasives, and some the bodying-up with a mild solvent. Others obtain reasonable results by a combination of both methods. We should be glad of your comments in this respect. —H. T. P. L.

The best wood fillers for use under lacquer are composed of silex, linseed oil and hard-drying kauri varnish, thinned with turpentine and naphtha. I do not know where in Australia satisfactory silex can be obtained, but as you know there are two or three large houses in this country whose material is pure, dry, and suitable for the purpose. Wet silex, or that adulterated with gypsum or clay, has caused considerable trouble in fillers.

As far as I know, the users of wood lacquer in this country use the method of rubbing down with abrasives, sometimes followed by a mist-coat of thinner to heel the scratches. Flat lacquer is used widely instead of rubbing to a dull finish.

There is so much in the individual finisher's opinion as to whether to use sandpaper or pumice and oil, or pumice and water and so on down the line, that no hard and fast rule can be laid down.—S. P. Wilson.

SUPERIOR WOOD STAIN POWDERS

For Lacquer and all finishes.

Complete variety of shades. Samples and information on request.

W. D. LOCKWOOD & CO.
314 W. 14th St., New York

To Finish Cedar Chests

I desire some information on just how to finish cedar chests with lacquer that will give a nice finish at the least possible cost. What kind of finish should be expected from lacquer, fillers, sealers, etc.?—W. J. W.

Cedar wood does not ordinarily require the use of a filler, as the pores of the wood are quite small. Sometimes it is necessary to fill small knot-holes and other defects with special crack fillers made by manufacturers of paints, varnishes, etc. Neither is a stain required, as the natural color of the cedar wood is very pleasing.

The oil in cedar wood makes it rather difficult to produce a good finish unless extra good materials are used. Pure white shellac has been found about as good as anything for holding back this oil in the cedar wood.

If a varnish finish is to be produced, at least two coats of white shellac should be applied directly next to the wood and it would be better if each of these coats is allowed to dry overnight. One or more coats of gloss varnish or rubbing and polishing varnish or flat drying varnish can be applied over the shellac coats and left either in the gloss, or rubbed to a dull surface, or polished after being rubbed.

The varnish should be quite tough and elastic for finishing cedar chests so as to resist scratching and marring as much as possible, and it should be given sufficient time to dry hard before rubbing. Some of the new clear

The Compressor for perfect spray painting

THERE'S one point you've decided on—that is to get the best spray gun manufactured. You want your paint jobs to build up your reputation.

But don't overlook this fact. No spray gun is better than the Compressor that runs it. That's why you should insist on a Model "P" Quincy. You'll get steady pressure, clean, dry air free from oil, and quiet, vibrationless service for a life-time. Quincy Compressors are built to make any kind of spray gun 100% efficient.

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In five sizes. Can be furnished either with gas engine or motor drive. In portable or stationary style.

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K306

wood lacquers hold back the oil in cedar wood as well as white shellac. Others do not hold this oil back much better than an ordinary substitute shellac.

If the proper type of lacquer is used the shellac coats can be dispensed with and the lacquer used directly over the bare cedar wood, using at least three coats of lacquer. All of the lacquer coats can be applied in one day if absolutely necessary, but better results will be secured if one coat is applied each day. The last coat can be rubbed with pumice stone and oil after drying overnight.

It is barely possible that you refer to finishing cedar chests which are veneered on the outside with walnut, mahogany, gum, or some similar wood. In this case, the proposition of finishing will be the same as for any ordinary piece of furniture, namely, the use of a water or oil stain dried overnight, a thin coat of white shellac reduced at the rate of 7 parts of alcohol to one part of shellac, air dried at least five hours, sanded smooth; a coat of paste wood filler of the proper color, wiped off across the grain of the wood about fifteen minutes after being applied, and air dried from 24 to 48 hours; then two or more coats of varnish, shellac or lacquer, according to the type of finish desired.—I. F.

H. A. Schwartz Joins Superior Spray Co.

It is announced that on May 1st, 1927, Mr. H. A. Schwartz, formerly New York Manager of Paasche Air Brush Co., became an officer of the Superior Spray Co., 130 W. 3rd St., New York City. Mr. Schwartz will be in charge of the management, serving the trade with a complete line of spraying equipment.

Be sure that your finishing materials are thoroughly mixed

Hand stirring is obsolete and inefficient. This portable mixer assures constant uniformity of lacquer, paint, enamel, Duco, varnish, etc.

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New Haven, Conn.

No evaporation — no loss of operator's time mixing spray cup at a time—no guess-work about materials being thoroughly mixed.

SAVE BY SAVING

for toy finishers
for automobile builders
for machinery painters

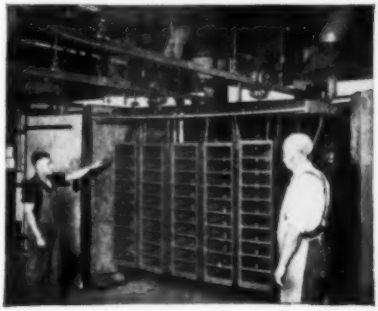
(for all finishers)

for furniture manufacturers
for stove manufacturers
for automobile refinishers

This Section is devoted to the application, baking and polishing of finishes to be dried in ovens.

Baked Finishing

Do Maehler Baking Ovens Pay?



ONE NEED not depend wholly upon our word—hundreds of installations, in some of the biggest industrial plants, afford evidence of satisfactory service. The complete Maehler system employed in enameling, japanning or lacquering assures a first-class baked job.

Gas, electric or oil heated?—Our experience qualifies us to suggest the properly heated oven to fit your individual needs if you have no preference. Please feel free to consult us—at least, request our very interesting literature covering baking oven equipment. No obligation.

The PAUL MAEHLER COMPANY
INDUSTRIAL OVEN BUILDERS
2220 W. LAKE ST. CHICAGO, ILLINOIS

Above appears a shallow tank of volatile liquid just after it had burst into flames. At the right the same tank a few seconds later—the fire smothered by the Grinnell Automatic Foam Tank.

Dip Tank Fire Hazards

PLANTS which utilize the dip tank method of finishing are offered a quick, automatic protection in case of fire.

It is the Grinnell Automatic Foam Tank, a device combining two dependable means of combating fire—the Grinnell Automatic Sprinkler Head and Foam.

When a fire starts, the quick-acting sprinkler head opens immediately—a stream of foam flows from the tank, spreads over the flaming liquid and instantly smothers the fire.

There are various methods of installing Grinnell Automatic Foam Tanks, according to the position of apparatus used in dipping. Drawings of typical installation and full details are given in free booklet. Write for it to Grinnell Company, Inc., 311 W. Exchange St., Providence, R. I.

GRINNELL COMPANY

75,000 Hardware Pieces Daily Through Bake-Enameling Process

Describing operation of a machine which automatically takes hardware parts through the entire finishing process—cleaning, rinsing, drying, dip-finishing, draining, baking and cooling

By W. R. Yawrood

THE KEYNOTE of continued popularity is progress, improvement and development. This is the incentive back of the beautiful, enduring finish reflected from Richards-Wilcox hardware, and for the miracle machine in the Richards-Wilcox Mfg. Co.'s plant at Aurora, Ill., which in a day's run converts 75,000 pieces of unfinished door hardware (approximately 30 tons of steel) into enameled objects of enduring beauty. The story reflected in these handsomely finished pieces of door hardware is an entrancing tale of industrial progress.

An Early Baking Oven

When the concern was a toddling industrial infant, struggling for a place on the stage of world usefulness, the enameling of its products was accomplished in a little sheet iron oven 3-ft. wide, 3-ft. high and 18-in. deep, insulated with a 2-in. wall of sand and heated by means of a gasoline burner which was connected with a tank fastened to

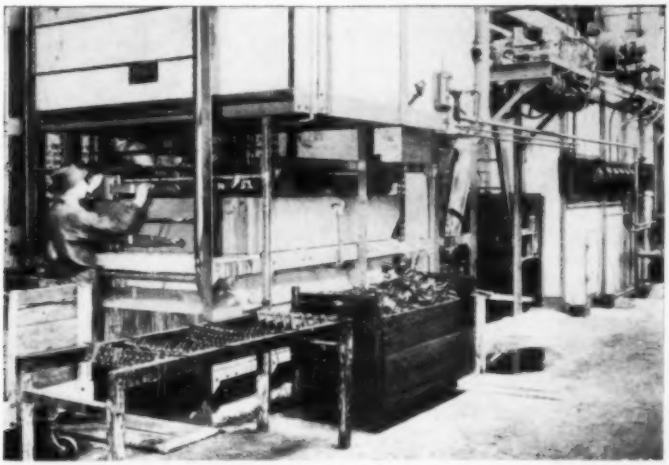


Fig. 1—General view of the finishing machine, showing its two sections, in the first compartment—the cleaning, drying and dipping units; in the second—the baking oven followed by a cooling area.

the side of the oven. A day's "bake" consisted of two or three dozen pieces.

Between that embryonic enameling device and the impressive unit which now operates in the present finishing department, two intervening stages of progress mark the years. In 1904, increasing business made necessary increased enameling facilities. A baking oven was then built 8-ft.

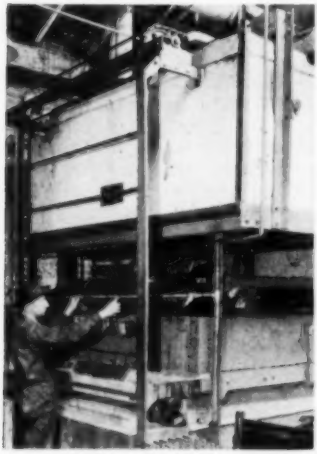


Fig. 2—Close-up of loading end where hardware parts are placed on slowly moving horizontal bars.

wide, 8-ft. deep and 6-ft. high; it had brick walls and was heated by means of a hard coal heater. This oven baked one load a day and had a capacity of 1½ tons of material. The parts were carried in by hand.

The third baking oven, constructed of sheet iron lined with asbestos and heated with gas burners, measured 8-ft. wide, 7-ft. deep and 6-ft. high. Two of these ovens were built in the company's own plant. Two and three loads a day, consisting of approximately 30,000 pieces, were finished in these two ovens. The material was run in on steel trucks.

Improved Equipment

After the war, the rapid advance in popularity of the company's products again called for further improvement in the enameling process of its goods, for two reasons:

First, to reduce the time required in the enameling process;

Second, to increase the quality of the finish, by making it more uniform, more beautiful and more enduring.

The modern industrial enameling equipment illustrated in these pages, provided the answer to this demand. In this machine 75,000 pieces of hardware are enameled daily—cleaned, rinsed, dried, dipped, drained, baked and cooled, all in one continuous operation.

This hardware consists of hanger parts, brackets, wheels, frames, pendants, aprons, joints, shovel handles, hinges, pulls, locks, latches, door guides and other parts of the thousands of pieces used in the manufacture of sliding door hangers and other hardware products.

Only two regular operators are required to tend this machine. At the loading end, one man suspends the unfinished metal pieces on cross bars, as shown in Fig. 1. The parts are carried through the various operations on slowly-moving, chain conveying equipment furnished by the Stephens-Adamson Mfg. Co. The processes of cleaning, heating and enameling are entirely automatic.

The Process in Detail

When the pieces enter the machine, as shown in Figs. 1 and 2,

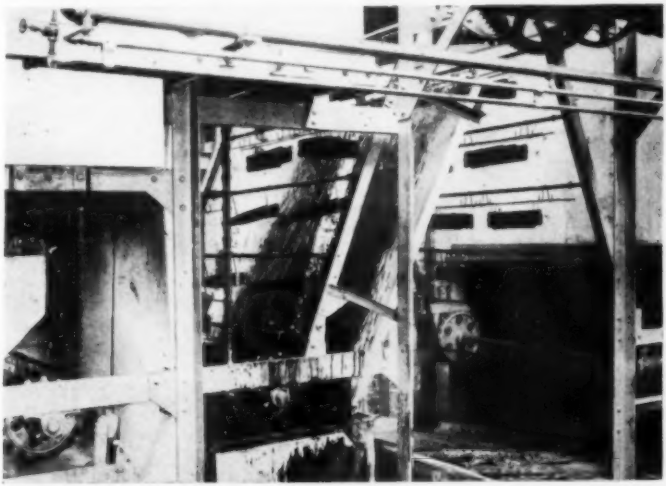


Fig. 3.—Leaving the dipping vat, the enameled parts move upward over the inclined drain board to enter the baking oven.

the moving crossbars slowly lower them into the washing vat. This vat contains a solution of hot chemical which cleanses the hardware thoroughly from all dirt, grease, oil or other extraneous matter.

The second station in the process consists of a vat of clear cold water in which the cleaned metal parts are thoroughly rinsed.

The third station is a drying chamber, the temperature of which is kept at 500-deg. F. The steel is so hot when it comes out of this drying chamber that the human hand cannot bear it. It is then ready to enter the enamel vat—so clean that it will take a smooth, clear finish which is not underlaid with deleterious material of any kind that might cause the finish to be rough or to lack permanence.

Entering the enamel vat hot, the steel presents a smooth, clear receptive surface; it is properly prepared to receive a coat of enamel, which will dry evenly, effectively and smoothly.

Dipping, Draining, Baking

Because of the fact that all of the parts are perfectly clean when they enter the enamel vat, they do not release any dirt, oil or other extraneous matter, which might be deposited on following material. In other words, the enamel is always perfectly clean and 100 per cent pure.

Passing out of the enamel vat, the hardware moves over the drain boards, onto which the excess enamel drains, as pictured in Fig. 3. It then enters the baking oven, where it is conveyed slowly with an up and down motion while the enamel is baked by a constantly maintained temperature of 450-deg., to a hard, glossy, permanent finish—a finish so scientifically applied that it act-

ually becomes an integral part of the hardware itself.

Moving through a cooling area which gradually reduces the temperature of the hardware to the point where it can be handled comfortably, the material moves

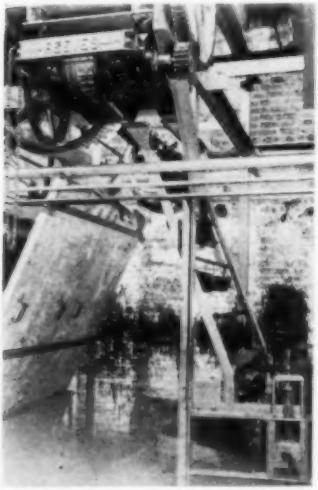


Fig. 4—Variable speed transmission drive located between the cleaning—drying—dipping unit and the baking-cooling unit of the machine.

out at the far end of the baking oven, ready to be received by the operator there, as shown in Fig. 5, and placed in stock or shipped.

Usually one man watches the pyrometers, regulates the oven heats, increases or decreases the speed of conveyor and supervises loading and unloading of the machine.

Machine Details

The whole machine is a self-contained unit approximately 45-ft. long, 12-ft. high and 9½-ft wide. There are two separate oil-fired ovens, the first of which dries the cleaned pieces while the second bakes them after they have been enameled. The two parallel strands of chains, with closely spaced cross bars upon which the pieces travel complete a circuit of over 200-ft., passing around 48 sprockets and making 24 bends.

Because of the unusual number of bends, the varying temperature and the uneven loading, every effort has been made to minimize frictional losses. A high grade steel-bushed roller chain with special clearance for high tempera-

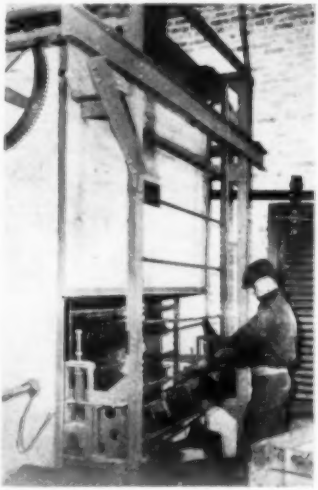
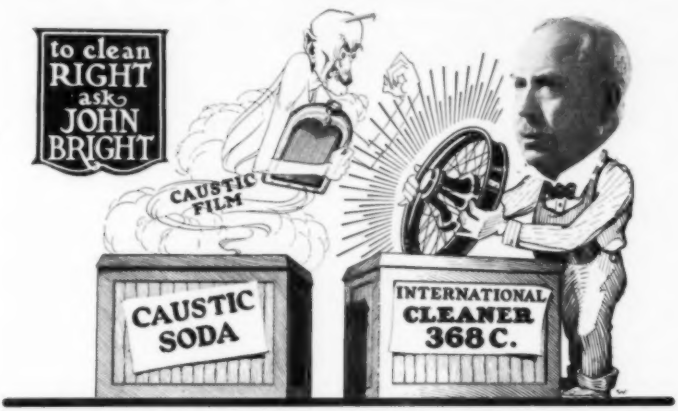


Fig. 5—At thedischarge end where another operator removes the glossy, permanently finished hardware.

ture work is used. All idler and drive shafts rotate in roller bearings while the sprockets which must turn upon studs are also equipped with roller bearings. To decrease the chain tension with its resulting frictional loss, the chain is driven in two places.



John Bright Insures Perfect Japanning with INTERNATIONAL 368C

Faulty japanning and painting is often due to the fact that a caustic film is left on the metal before the japan is applied. This caustic film combines with the oils in the japan causing buckling, cracking and blistering after baking.

Therefore, the ideal cleaner to use must not leave that dangerous caustic film. And, of course, it must remove every trace of oil—rapidly, surely and economically.

If you want perfect japanning, let me send you a trial lot of International No. 368C. No cost if it doesn't beat anything you ever used.

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Write today for free samples and check them up before the lacquer season gets into full swing.

All Grades
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Dept. F. Nixon, N. J.
"Nitrators since 1898"

When writing for samples please state quantities, grades and viscosities desired.

A 2 h. p., 900-r. p. m. motor drives the whole conveyor through a variable speed transmission (see Fig. 4), making it possible to vary chain speed at will from 8.8-in. to 34.6-in. per minute. Special spring take-up bearings or tighteners are used in two places to maintain a slight tension and prevent either excessive slack or tension.

The control of this machine is flexible enough to cover practically every painting or enameling process. Each step is under the control of the operator.

The temperature and circulation of the washing and rinsing baths can be closely regulated to clean the pieces most efficiently. The heat in the drying oven and in the baking oven is under direct control. The temperature of the pieces entering the enamel dip tank can be varied for most economical coating and, finally, the speed of the conveyor can be increased from three-quarters of an hour to three hours for a complete circuit. In short, the machine makes it possible to reduce the finishing process to the exact formula necessary to produce articles with a uniform finish.

45 Minutes Completes the Job

From the time material enters the enameling machine until it is removed by the operator at the unloading end, the enameling process requires 45 minutes.

This enameling machine is actuated by seven electric motors. A Brown recording chart operating in conjunction with automatic thermostat, controls the heat of the enamel baking oven. Three oil burners furnish the heat for cleansing, drying and baking.

Thus did Richards-Wilcox achieve the two desirable elements in its finishing process, as

Armitage ARMORCOTE BAKING ENAMEL

PROTECTS metal against the elements. A durable baking enamel that combines vitrified hardness and elasticity, and it does not chip or check.

Leading automobile and metal products manufacturers use **ARMORCOTE.**

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This Polish is highly endorsed by finishing rooms in large plants for the polishing of

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previously pointed out, namely, a saving of time and an improvement of quality in the finish—and still another, a saving of labor.

Note: This article includes excerpts from "Doorways", published by Richards-Wilcox Mfg. Co., and from "The Labor Saver", published by Stephens-Adamson Mfg. Co., both of Aurora, Ill. Gehnrick Indirect Heat Oven Co., Inc., equipment is employed in this particular installation.

Japan Room Dip Tanks

The dip tanks used in a japanning department should be properly proportioned. Deep but narrow tanks should be used instead of wide and shallow ones, as the former allow any dirt that may have gotten into the japan, to settle to the bottom. All tanks should be provided with rim covers, to be kept on when the tanks are not in use.

It is also a good plan to equip each dip tank with a strainer at one end and extending down to within a foot of the bottom; the strainer to be covered with a fine-mesh copper screen that will hold back small particles when fresh japan or reducer is added. By having the strainer below the surface of the japan, bubbles are not formed when new material is added, as any bubbles present are likely to appear on the baked product and cause rejection.

The drain board should be as near the oven as possible, particularly to lessen the chances of stirring up dust while moving the freshly coated articles.

Reverting to the subject of straining material into the tank; construct a wooden frame on which can be fastened a piece of coarse wire screen—about ¼-in. mesh or even that kind called chicken wire—and form this so it will be depressed about 6-in.

in the center. Over this lay a piece of fine cheese-cloth, then a layer of absorbent cotton, cotton batting, or trimmers' cotton wadding, and finally on top of that lay another piece of fine cheese-cloth. It is advisable to build the strainer as deep as possible, as the greater weight of liquid will force the material through the strainer that much faster.

Whenever japan shows indication of being dirty the tanks should be emptied at once, carefully cleaned by washing with naphtha, and the japan strained back into it again. This should not be necessary often, if the work is always clean before it is dipped, if the room is clean, if the tanks are kept covered when not in use, and if all fresh japan or reducer is added to the tanks through a strainer, and the mixing is done without agitating the settlings that may be in the bottom of the tank.

Even so, it is a good plan policy to let the tank of goods stand overnight before using. The japan must be used at the same consistency at all times to maintain uniform finish on the work. If too heavy, it will not flow properly and might sag; it will require more heat to bake it hard, and the resultant finish will have higher luster. Conversely, if the japan is too thin when used, it will not fully cover the seams and edges, it is likely to bake brittle, and the resultant finish will be duller than standard.

Systematic checking of the material in tanks is done by means of a Baume hydrometer. Once the gravity is determined for the particular finish desired it is no hard task to maintain this gravity by testing each morning.—J. E. C.

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Nothing But
Lacquer
Products

Why do we repeat this statement? Because we believe it is of practical importance to you, that we manufacture *only* lacquer products—at the largest lacquer-making establishment.

It means to you that the "guess" is removed from your finishing problems. It means that Zellac comes to you—not as an inferior finish produced through "by-products methods"—but as the *peak of lacquer development*, arrived at after two generations of study, experimentation and progressive lacquer-making.

When Zeller lacquer chemists give you a grade specially arrived at by a special analysis of your finishing requirements, you can be sure that the Zellac delivered to you on this basis will give you uniform results in beauty and economy of finish. Let us consult with you regarding your finishing requirements.

To increase the salability of our customers' products, attractive Zellac Tags are furnished upon request.

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ZELLAC

ZELLAC

Refinishing Motor Cars in Small Shop*

Consultant on finishing problems gives specific and detailed instructions for refinishing automobiles in the smallest type of shop—according to the latest approved methods

By K. N. Kathju, M. S.

OPERATION No. 10. *Air Dry Primer*—The operator will notice that by starting on one side of the car and continuing around to the other, enough time elapses for the prime coat to dry. However, it is advisable to let the surface air dry another ten minutes.

Operation No. 11

Dry Sanding Prime Coat

Dry sand the prime coat very lightly, especially the sags, runs, etc., caused through faulty spraying. Use No. 320 aluminum oxide paper.

Operation No. 12

Spot Glaze (Using Pyroxylin Putty) and Sand

This operation may be resorted to in exceptional cases where high quality work is desired. Spot glaze file marks and other surface indentations if necessary, applying pyroxylin putty with 1½-in. flexible putty knife, and being careful to use just enough to cover the uneven surface. While the putty is still soft feather out the edges, using a medium grit sandpaper (No. 280).

Operation No. 13

Tack Rag the Entire Body

Note: To make a tack rag, dip a yard or more of bleached cheesecloth into rubbing varnish. Wring it and spread it out to get tacky. When it has attained a certain amount of stickiness, such that the varnish itself does not mark the surface on which tack rag is used, fold same and save it in a cloth dampened with water. Remember, "a tack rag is a painter's best friend."

Operation No. 14

Pyroxylin Surfacer

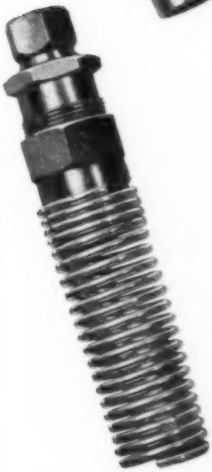
The application of this material is necessary only when a car body is to be brought up from bare metal, or when the old finish is so checked that it must be removed. For a majority of cars already finished in pyroxylin, surfacing the car body is unnecessary.

For spraying, unless otherwise specified by the manufacturer, reduce the thoroughly-agitated and well-paddled material in the container with its own volume of pyroxylin thinner. Load the air brush with same, or connect air brush with gravity-feed bucket containing material thus thinned. Beginning with the cowl, spray a double coat of surfacer over the entire surface of car body. It is always advisable to work from top down.

The term "double coat" here and hereafter will imply the spraying of a coat over a small

*Continuation of article that began in May issue.

Spray Hose Couplings



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Makers of the famous Sphinx Glass Run Channel.

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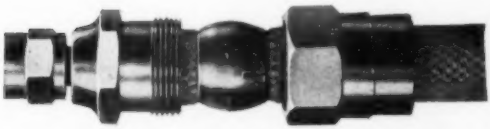

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area, first vertically, then followed immediately with another coat sprayed horizontally—or vice-versa. In either case the spray strokes must overlap one another at least half an inch. The practice of spraying a double coat does away with familiar streaking, which later doesn't speak highly of the operator's skill.

Another common practice of trying to cover solid, in one or two coats, by piling on material, is beset with grave drawbacks and will invariably result in waves, runs, sags, etc., which would require more time in repairing than necessary—more than if the material had not been piled on so heavily.

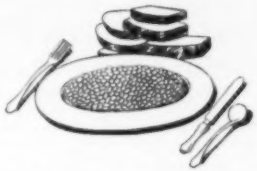
In general, one coat of surfacer is enough to fill in the minute checks, scratches, etc. Nevertheless, as many as half a dozen coats may be sprayed if desired, provided each coat is air dried at least ten minutes. The last coat of surfacer, however, should be dried at least one hour at room temperature before proceeding to water-sand same.

Note: It is not necessary to surface fenders, etc.

Operation No. 15

Water-sanding Surfacer

The qualities known as smoothness, richness, and depth of finish on a car body are inseparably associated with smoothness of its undercoat and, unlike the proverbial expensive fur coat that covers a multitude of rags, the finished coat will not hide effectively the imperfections, irregularities, etc., of the undercoats. In fact it will magnify them in reflected light, much to the dis-



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LITTLE WAYS AND MEANS,
MAKE A FUND FOR RAINY DAYS,
AND BUY YOUR BREAD AND BEANS.
—*Selected.*

SOMEONE gave us one of those calendars that have wise sayings and proverbs under the big red date and it occurred to us that the poem above tells a good story for ALAKA products.

ALAKA saves: (1) Time, because it lessens the possibilities of blushing and the job, rarely, has to be done over again; Money, because less material goes a longer way, giving more coverage per unit area; Trouble, because when your product is finished with ALAKA, customer complaints are avoided.

If the savings of Time, Money and Trouble, by using ALAKA, make you either interested in or skeptical about our product—you owe it to yourself, and to us, to have ALAKA demonstrated for your approval.

Write for (1) A representative (2) A sample (3) A booklet.

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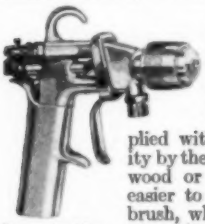
HOW HANDGRIP "BALANCE" HELPS THE FINISH

THE ease of handling the Handigrip spray gun and its perfect automization of material are factors in securing the flawless finish desirable on high quality articles.

Cup Gun

The Handigrip is a "balanced" gun. The cup is directly under the hand and in line with it, placing no strain upon the hand and wrist. You do not *lift* a Handigrip gun. You point it. This, with the two-finger trigger, relieves the fatigue of hours of painting.

The spray is instantly controlled by an automatic spring valve. A self-aligning collar holds the outer nozzle in perfect alignment with the inner one, so that with a Handigrip, new or old, the material is thoroughly atomized from edge to edge of the spray.



Pressure Feed Gun

Any kind of material — lacquer, oil paint, enamels, varnishes, or wet porcelain — is applied with equal facility by the Handigrip on wood or metal. It is easier to clean than a brush, which makes it convenient where there is a frequent change of material or color.

The Handigrip is interchangeable, used either with a quart cup, the material being fed by suction, or as a pressure feed gun with tanks ranging in capacity from two to ten gallons. Furnished separately or with complete outfits of several sizes.

The Plummer-Huff Company positive guaranty provides a demonstration on your own work without risk. Write for particulars. Kindly address Dept. F.

THE PLUMMER-HUFF COMPANY
Napoleon, Ohio

gust of both operator and owner. Consequently, with the sole purpose of obtaining the best results, water-sand a small surface at a time with No. 280 or No. 320 wet-or-dry sandpaper.

A quarter sheet of sandpaper should be held in the palm of hand with thumb. Wet down the surface to be sanded with a sponge dipped in water and proceed to water-sand the panel with a firm hand. The sanding should be accomplished by either a horizontal or vertical movement of the entire forearm. Haphazard sanding with a rotary motion should never be tolerated. The surface being sanded should be washed off with sponge and water and the smoothness of the surface determined with the aid of a skiver.*

Or, by going over the sanded surface, the roughness of such surface may be determined and chalked out for further sanding. When the entire surface has thus been sanded smoothly, it should be thoroughly washed with clean water blown with compressed air around mouldings, etc., and wiped dry. Care must be exercised in sanding rough spots, so as not to rub through to metal. Rubbed-through, bare-metal spots must be touched up with primer before proceeding further.

Operation No. 16

Refinishing Chassis, Wheels, Fenders, Dust-shields, etc.

CHASSIS—Whether or not the chassis has been primed, it should be sprayed with a solid coat of black pyroxylin, reduced with its own volume of pyroxylin thinner.

WHEELS—Refinishing of different types of wheels in colors,

*Discussed in previous articles.

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their enameling, lacquering, and other problems relative to them will be discussed in a subsequent issue. However, if it is desired to refinish ordinary black wooden wheels, it is necessary that the spokes be scrupulously sanded and cleaned and rims likewise be sanded and freed from rust and other foreign matter. This accomplished, jack up one wheel, revolve it slowly by hand and spray each spoke separately. Finally, spray the rims both inside and outside, as shown in Fig. 3. All four wheels may be finished in this way.

FENDERS, DUST-SHIELDS, ETC.—Next, starting on one side, proceed to spray a double coat of the same reduced black pyroxylin on fenders, dust-shields, aprons, etc. Beginning at the original starting point, spray another double coat of black pyroxylin. In general practice, it will be found that two double coats are enough to get the degree of covering and luster desired. However, more than two double coats may be sprayed if desired.

If the body is to be finished in black or two-toned in black, the entire hood, or only the upper part of it, may also be given two

Fig. 3—Jacked-up wheels—rotating by hand and spraying. Notice respirator worn by operator.

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or more double coats of black pyroxylin—allowing at least ten minutes between the coats to air dry.

Air Pressure, Compressor and Motor Recommendations Questioned

It seems necessary to call attention to several mis-statements in the article "The Automobile Repaint Shop", by K. N. Kathju, in April issue.

Mr. Kathju speaks of a compressor with "an output of about 6-cu.ft. per *second*. A compressor of this size would occupy most of the building and operate about 60 spray guns. Evidently he meant 6-cu.ft. per *minute*—a standard size, though an 8-cu. ft. outfit would be better. He also states that 70-to-110-lbs. of air pressure is necessary to atomize lacquers. 45-70-lbs. of air pressure is more nearly correct, and incidentally more within the range of a 6-cu. ft. compressor.

He also recommends "a ½-h.p. D.C. motor, 120 volt, 1700 r.p.m." In the first place, no ½-h.p. motor will develop 6-cu.ft. of air at 70-lb. pressure. It requires approximately 1½-h.p. to operate the commercial lacquer guns on the market.

The choice of voltages would lead the layman to believe that there is a choice, while actually in 99 cases in 100 you take the current the power company provides. As a matter of fact the ideal voltage is 220 volt, 60 cycle, three phase, because those motors are cheaper and they usually enjoy a low power rate.

We are calling this to your attention because there is already too much confusion regarding air

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pressure and air compressor requirements in the trade.—Kellogg Mfg. Co.

Note by K. N. Kathju: The recommendation in my article should have read "6-cu. ft. per minute." With respect to the other statements you question, experiments conducted in the Ford Motor Co. laboratories when I was there, lead to those conclusions.

I maintain that you can not get a decent spray finish job, with nitro-cellulose lacquer, at less than 60-lbs. air pressure, and for fine work the pressure should be 70 to 110-lbs. Otherwise there will be improper atomization, which will result in orange peel, disrupted film and greater expense for polishing, etc. A great many spray guns that are now on the market were made for big plants, hence can not be operated satisfactorily at less than 60-lbs. pressure.

Hundreds of units, as per my recommendations, have been installed by Ford Dealers all over the country and are giving excellent results, so far as I can learn. Refer to the Ford Service Bulletin, August 1926 issue.

American Decalcomania to Have New Plant

The American Decalcomania Co. Inc., manufacturer of decalcomania transfer products, announces that within the next 90 days the company will be in its new plant, located at 4326-38 Fifth Ave., Chicago, Ill. The plant is to be one floor, skylights throughout, of modern construction and equipped with the latest machinery in the manufacturing of decalcomania. The capacity of this plant will be four times that of the old works.

Beginning July 1, the company will have display space in Room 2456, American Furniture Mart Bldg., 666 Lake Shore Drive, Chicago.

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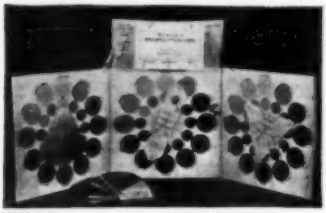

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Spray Gun News

The Mellish-Hayward Co. of Chicago, announces a new spray gun for industrial finishers. The "Pneu-Gun," illustrated herewith, is said to be the lightest made, without sacrificing strength or durability. A sensative, one-finger, material control permits

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the operator to change the width of the stroke instantly for a narrow or a wide surface, producing a finish that looks as if it is put on in one solid piece.

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Industrial Safety Catalog

Willson Goggles, Inc., of Reading, Pa. is distributing a 20 page booklet in which is illustrated and described an interesting line of goggles, helmets, handshields and spray masks for use by industrial workers, including industrial finishers.

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Sanding is Important in Wood Finishing

In this day of speed and production, there are many vital points overlooked in good finishing. I will try and illustrate a few.

The finishing foreman should know, and have something to say about, all the wood entering into the manufacture of furniture before it gets to the finishing room, because it is of importance to him whether that particular type of wood will finish up to his standard sample. Therefore mutual co-operation between cabinet and veneer foremen is essential.

There is no finishing foreman who can produce good results if the product is not properly handled in the making. Sanding is the most important operation pertaining to a good finish, therefore management should insist that every foreman be thoroughly acquainted with the product, so that before starting to finish the surfaces he can detect those little flaws that cause him trouble.

The following is the regular procedure in my finishing department:

1—General inspection of product.

2—Water stain; wipe off all excess stain. (This prevents raising of grain and softening of glue under veneers.) Good sanding is necessary in this operation, the workman using a block about 1½x3-in. "felted" with No. 6/0 garnet split paper. Sanding should be with the grain, the workman using long strokes and keeping away from the edges as much as possible.

3—Shaded with shading gun, and sprayed with light coat of lacquer or pure white shellac.

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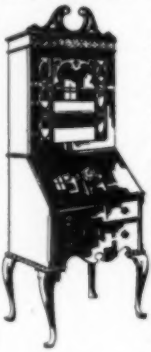

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By Smith Bowen

4—Slightly sanded with No. 7/0 sandaper and filled with well worked-up filler, taking care to remove all excess filler from corners and crevises in carvings. Let stand over night.

5—Full-body coat of clear lacquer at 60-lb. air pressure.

6—Slightly sand with No. 7/0 sandpaper, and second coat.

7—Water sand, using No. 320 wet-or-dry paper over felt pad, using plenty of water and a little 4/F pumice stone.

8—Final coat of full-body lacquer. Let stand over night, rub the usual way, clean up and wax.

The above has proved successful and, with careful observation as to cleanliness, accuracy in formulas and quality of material used, there is no reason for not getting good results. Do not use any burning in stick shellac under lacquer, as it will raise! Build it up with heavy lacquer.

As for imperfections in sanding, roughed up places, etc., these are not always due to wrong sandpaper. Often the cause is due to the wood itself, especially Cuban mahogany. There is sometimes the tendency of the grain running hard and soft. Results after sanding show that the paper cut the hard surface and left the soft part spongy. However, this can be rectified during the second coat by lightly sanding the soft or fuzzy places and spraying a coat over that portion.

In regard to a poor finish on the surface, I have personally had this happen to me, but by careful study I found the cause of it in my case. It was due to negligence in the machine room, while planing cores for veneer. The core plates were put through the planer and probably forced

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against the plane, leaving small impressions unseen to the naked eye, but when the veneer was put on and had sufficient time to dry—and just after the second coat of lacquer, and when water sanded—these same impressions showed up in the veneer. This gives the finisher a very poor surface to start with—in other words, a poor foundation.—Lawrence F. Hess, Jr.

Finishing Hospital Cabinets

Speaking from experience I have had much success with the following schedule for finishing metal cabinets so used in hospitals:

1—Spray coat metal primer (baked 2 hours at 150-deg. F.)
2—Fill holes with metal paste primer (knifed).
3—Sandpaper.
4—Spray coat of lacquer enamel undercoat (ivory or white).
5—Spray coat of lacquer enamel (ivory or white).—Joseph Cowan.

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Man now employed as finishing foreman has had many years experience in all branches of industrial finishing. Wants to connect with a representative manufacturer of finishing materials as demonstrator. References furnished. Address IF—163, care INDUSTRIAL FINISHING.

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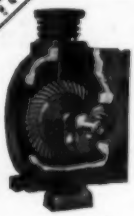

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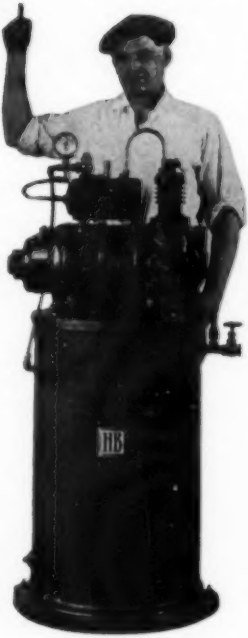

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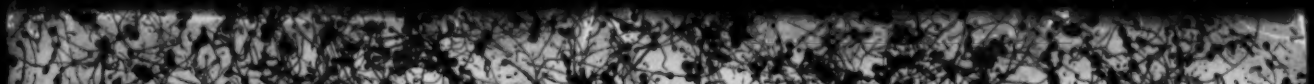
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